MAY 18, 1959

STEEL
The Metalworking Weekly

A PENTON PUBLICATION

Giving More Public Service

Good business climate—you can't cuss your way into it. You can't buy it. You can't wish it into being. For how managers are winning it—through more public service, especially in politics—see Page 99.

A PROGRAM FOR MANAGEMENT 1959 . . . No. 4

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Steel Imports of 400,000 Tons in 2nd Month Seen if USW Strikes

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Split Bearings Do Special Jobs

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How New Ryerson Pricing Works

METALWORKING OUTLOOK—PAGE 47

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SPIRAL BEVEL GEARS

Spiral bevels comprise just one of the ten gear types in which we specialize, but, speaking of them alone, we have been active in their manufacture since their wide-spread acceptance around 1920. Thus, our experience covers the entire history of this versatile and useful gear type. We were among the first to use lapping on a production basis and to emphasize the importance of lapped and mated gear sets. Automotive Gear was one of the pioneers in developing and promoting the use of special fixtures to eliminate, as much as possible, the chance of human error, and in this way furthered the progress and practicality of spiral bevel installations. Engineering aid in the design of these fixtures for any application is always available to spiral bevel customers . . . as is aid in any area where our specialized gear experience may prove useful. Our gear engineers are available for consultation. Just write!

EATON

AUTOMOTIVE GEAR DIVISION
MANUFACTURING COMPANY
RICHMOND, INDIANA

GEARS FOR AUTOMOTIVE, FARM EQUIPMENT AND GENERAL INDUSTRIAL APPLICATIONS
GEAR-MAKERS TO LEADING MANUFACTURERS

Will Help Control Enormous Volumes of Steam

This odd-shaped forging is as husky and rugged as it looks. It's an interceptor valve body, made of electric-furnace alloy steel, and it's going to be pitted against the forces of steam. The finished valve will be one of the flow-control units in a big turbine system.

Starting with a corrugated ingot, Bethlehem forged and machined the part to rigid specifications. Here you see it just about ready for shipment to the customer. Shipping weight, approximately 7800 lb.

This is a good example of the medium-sized forgings that Bethlehem is equipped to make. But if you need smaller pieces, Bethlehem can easily furnish them (drop forgings, for example, weighing as little as a pound). And our shops also make the largest forgings ever required—some weighing more than 100 tons.

Call us when we can be of service to you or members of your staff. Our engineers will gladly cooperate, from the planning stage to the finished product.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by
Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

Another new application for **TITANIUM**

PUMPING HIGHLY CORROSIVE SOLUTIONS?

Titanium provides the answer in "Durcopumps"®

The Duriron Co., Inc., designers and manufacturers of equipment for corrosive service, is among the first to take advantage of titanium's outstanding corrosion resistance in pumps and pump parts.

Working closely with Duriron engineers, Mallory-Sharon helped develop welding and forming techniques for production of a fabricated titanium centrifugal pump. Durcopumps, *with all wet end parts fabricated of Mallory-Sharon commercially pure titanium*, are being produced to order, for pumping hot nitric acids, hot chlorides, etc.

As proof of titanium's superior corrosion resistance, operation of a million-dollar chemical plant was being held up for lack of a suitable pump to handle boiling 65% nitric acid. Cost of downtime was $1,000 per day. Two titanium centrifugal pumps were installed in the line. To date, they have given *over 12 months' service*—compared to less than 30 days' service for nickel-base alloys previously used.

Mallory-Sharon engineers are ready to work with *you* in applying titanium. Write for Technical Data Sheet on *"Titanium Pumps for Chemical Service"*. Please address: Commercial Market Development, Dept. B, Mallory-Sharon Metals Corporation, Niles, Ohio.

MALLORY Ms **SHARON**

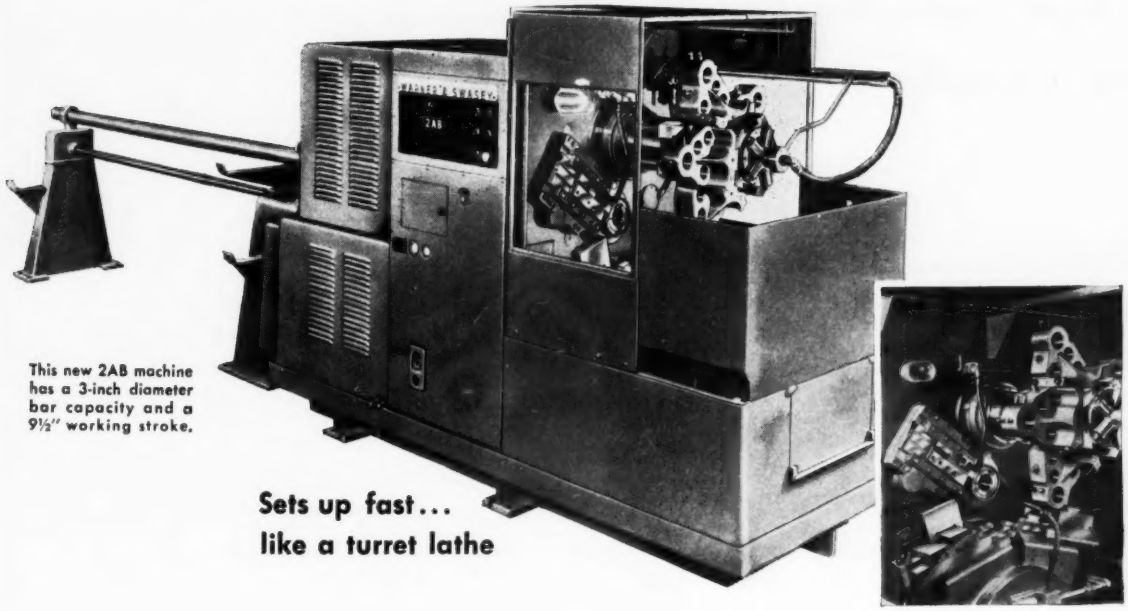
MALLORY-SHARON METALS CORPORATION · NILES, OHIO

Integrated producer of Titanium · Zirconium · Special Metals

1959 DESIGN ENGINEERING SHOW
PHILADELPHIA · MAY 25-28

NEW! Warner & Swasey 2 AB Single Spindle Automatic Bar Machine

...provides fast, automatic production of short, medium, or long-run precision bar jobs



This new 2AB machine has a 3-inch diameter bar capacity and a 9½" working stroke.

Sets up fast... like a turret lathe

Now, the shop-proven, cost-cutting features which have made Warner & Swasey Automatic Chuckers so outstanding in their field are available in a new Single Spindle Bar Automatic. Most important among the profit-producing features of this new Warner & Swasey 2 AB are:

● **FASTER SETUPS**—With no cams to change, time-consuming set-up procedures, usually encountered with automatic bar machines, are eliminated. Even your smallest lot bar jobs can now be produced economically on an automatic basis.

● **GREATER ACCURACY**—Only two wide—and widely-spaced—bearing surfaces support the turret. Thus, cumulative tolerance problems in conventional "multiple bearing" turret location designs are eliminated.

● **EASIER TOOLING FOR COMPLEX WORK**—Flexibility and accessibility of the 2 AB's cross slides and pentagon turret enable the use of a wide variety of machining methods. One operation usually handles even the most complex workpieces.

● **POWER FOR TOMORROW'S JOBS—TODAY**—The 2 AB's 25 horsepower, reversible motor more than meets today's rugged metal removing requirements and, coupled with a wide range of spindle speeds, permits the efficient application of the latest cutting tool materials.

● **"FREE" CUT-OFF TIME**—An independently-operated cut-off slide allows full utilization of both front and rear cross slides. The cut-off cycle may be started during any one of the pentagon turret stations. Thus, cutoff can be progressing during subsequent machining providing a cut-off cycle which is virtually "free".

● **AUTOMATIC RESTOCKING INDICATOR**—This ingenious device in the hydraulic bar feed mechanism automatically stops the 2 AB and lights an indicator light on the operator's control panel before the bar being machined runs out—prevents tool damage from improperly-gripped stock.

Why not call your nearest Warner & Swasey Field Representative and get the complete story on the new 2 AB. It can help increase both production and overall profits—so important in today's highly competitive picture.

WARNER & SWASEY
Cleveland
PRECISION MACHINERY SINCE 1880

NO MATTER WHICH WAY YOU TURN...WARNER & SWASEY CUTS COSTS

FARVAL—*Studies in Centralized Lubrication*
No. 218

Farval lubrication first choice for Hill-Acme Upsetter

On this 1¼-inch Hill-Acme Upsetter, Farval's timing cycle can easily be changed to conform with the service of the machine. Amount of lubricant delivered to each bearing is also adjustable.

BUILDING peak performance into their machines is a point-of-pride with Hill-Acme. That's why you'll find Farval lubrication systems on H-A machines such as this upsetter.

When the going's rugged, with shock, vibration and wear trying to take their toll, Farval continuously guards 59 vital bearings . . . continuously delivers measured amounts of lubricant at regular intervals.

More and more, machine designers, engineers and production men are turning to Farval for the kind of lubrication that spells uninterrupted, maintenance-free production. Let us tell you more. Write for Bulletin 26-S. The Farval Corporation, 3270 East 80th Street, Cleveland 4, Ohio.

KEYS TO ADEQUATE LUBRICATION

Wherever you see the sign of Farval—familiar valve manifolds, dual lubricant lines and central pumping station—you know a machine is being properly lubricated.

Affiliate of The Cleveland Worm & Gear Company, Industrial Worm Gearing. In Canada: Peacock Brothers Limited.

This Week in STEEL

The Metalworking Weekly

May 18, 1959
Vol. 144 No. 20

EDITORIAL 53

Management men need to know what makes people tick. Motivational research can uncover a lot.

SPECIAL FEATURE 99

Giving More Public Service

An important new dimension has been added to the role of the metalworking manager: Practical politics. The time to embrace it is now, while the movement is gathering momentum—the impact will be greater.

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STEEL, the metalworking weekly, is selectively distributed without charge to qualified management personnel with administrative, production, engineering, or purchasing functions in U. S. metalworking plants employing 20 or more. Those unable to qualify, or those wishing home delivered copies, may purchase copies at these rates: U. S. and possessions and Canada, $10 a year; all other countries, $20 a year; single copies, 50 cents. Metalworking Yearbook issue, $2. Published every Monday and copyright 1959 by The Penton Publishing Co., Penton Bldg., Cleveland 13, Ohio. Accepted as controlled circulation publication at Cleveland, Ohio.

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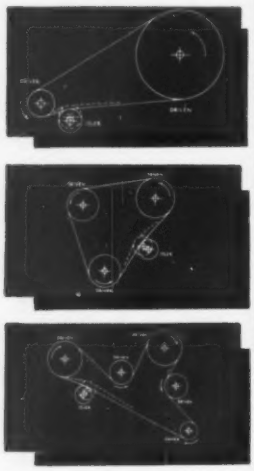
How to
drive
it with
Acme
chain
and
sprockets

Acme Precision Roller Chains and Sprockets are easily adaptable for most any drive where maximum efficiency is essential, a few of which are illustrated below.



Acme Chains and Sprockets deliver Positive – Efficient – Economical – Flexible – Rugged – and Quiet Power Transmission. For the solution of your power transmission problems, send them to Acme.

Write Dept. 10-G for new illustrated 100 page catalog which includes new engineering section showing 36 methods of chain driving.

Acme Chain Corporation
HOLYOKE MASSACHUSETTS

behind the scenes

Management Hies to Hustings

The Program for Management article this month (Page 99) concerns itself with something that management frequently toyed with but seldom formulated as a solid program: The encouragement of management participation in politics at the local level. The point brought out by the article is such participation pays off in many ways.

General Electric Co. was among the first industrial entities to recognize the need for this participation. It encouraged supervisory personnel to study civics. Bill Dean, STEEL's Chicago editor, and author of the article, reports that he was amazed at the size of the practical politics movement. "Many big companies that won't go on record just yet," he said, "are considering programs. I think the first real test will be the 1960 elections, although the time is really too short for much to be done."

You may be right at that, Willie—but a lot of us old Andrew Jackson Democrats are not too much concerned with long range planning; sometimes we can whomp up a program defending states' rights on a two day notice.

For persons interested in public service. J. J. Wuerthner Jr., General Electric public affairs consultant, has written a book, "*Businessman's Guide to Practical Politics.*" According to Bill, this book has become a primer for almost all programs of this nature.

Businessmen in politics? Why not? It might be the salvation of our political system.

Machine Tool Builders Compete

Any member of the National Machine Tool Builders' Association who has $5 to spare and a good tearsheet of an ad featuring his product, may put himself in line for a first award or an honorable mention in the NMTBA's 1959 advertising contest. Entries submitted must come within the association's definition of a machine tool, which is not as simple as you might think. A metal cutting machine tool is a power driven machine, not portable by hand, used for the purpose of removing metal in the form of chips. A metal forming machine tool is a power driven machine, not portable by hand, used to press, forge, emboss, hammer, blank or shear metal. This definition of a metal forming machine tool does not include diecasting machines, extruding machines, rolling mills, or welding equipment.

Any firm that can qualify may submit as many entries as desired, at the rate of $5 per entry. Additional information may be obtained from association headquarters, 2071 E. 102nd St., Cleveland 6, Ohio. Winners will be announced Oct. 15, and presentation of the awards will be made during the fall meeting at White Sulphur Springs, W. Va., Nov. 20.

The bulletin from which we lifted the above information caught our attention because it stirred speculation: Surely the material to be exhibited at White Sulphur as a result of this competition will truly represent national machine tools. Reprinted and bound, the resulting book would be of great value to everyone in metalworking.

Returning for an idle moment to that "not portable by hand" business, maybe a pedantic busybody could lift an eyebrow about it. Ah, well.

Distributors Hail Manufacturers

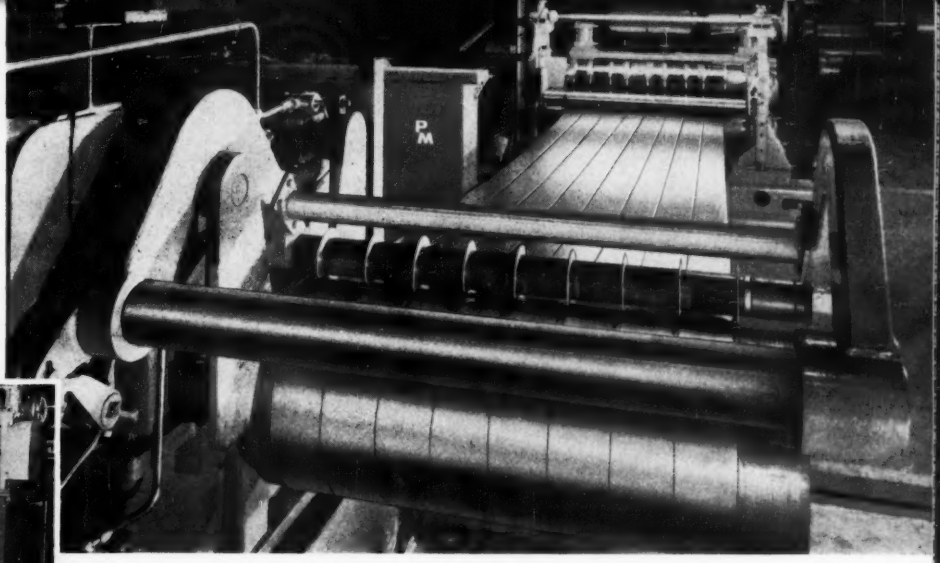
The Advertising and Awards Committee of the National and Southern Industrial Distributors' Associations was established in 1952, and they have been giving awards every year since to manufacturers who say nice things about distributors. You can make yourself eligible for one of these bronze plaque awards by writing to the Advertising and Awards Committee, 1900 Arch St., Philadelphia 3, Pa. You will receive an awards program; you simply fill it out, and you're in like Flynn—if you have been kind to distributors. This year (in the magazine advertising division), awards were won by Chain Belt Co., Milwaukee; Heller Tool Co., Newcomerstown, Ohio; Republic Steel Corp.'s Pipe Div., Cleveland; and Safety Socket Screw Co., Chicago. Presentations were made early in May down in Dallas.

For Offhand Response

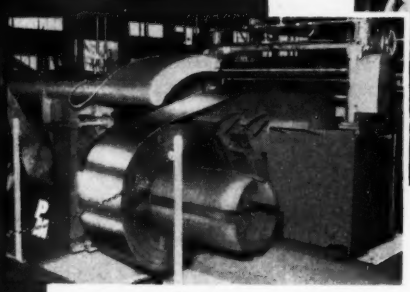
If you're going to study history and civics, try this test for fun: 1. Who was Woodrow Wilson's vice president? 2. Who formed the first billion-dollar corporation in this country? 3. What is the Sixteenth Amendment? 4. Name Nevada's two senators. 5. What was the Treaty of Guadaloupe Hidalgo? When was Wisconsin admitted to the Union? Indiana? Ohio? Michigan? 7. What President hired a substitute to fight for him during the Civil War? 8. What are you having for supper tonight?

Shrdlu

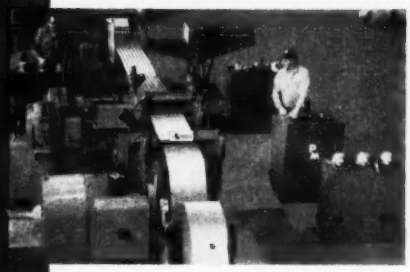
(Metalworking Outlook—Page 47)



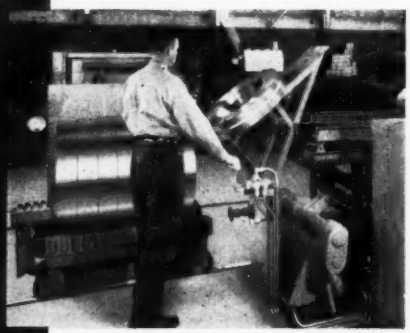
PM slitting lines are designed for efficiency. This complete, highly automated PM line in a warehouse handles a variety of metals — steel, stainless steel, aluminum, etc. The picture shows one of the time saving features of the line, a PM overhung arm separation device, used instead of heavy, individual large diameter discs.



PM uncoiler with a peeler that feeds into the flattener without manual handling — this device provides a safer, faster operation on this line, which handles gages up to 3/16", widths to 48", and coils as heavy as 30,000 lbs.



PM automatic edge control guides, .004 strip to slitter without edge damage on this light gage stainless line.



Automation in upending, banding, and downlaying coil saves time and dollars.

To get the kind of Slitting Line YOU need, use P/M PRODUCTIONEERED* EQUIPMENT

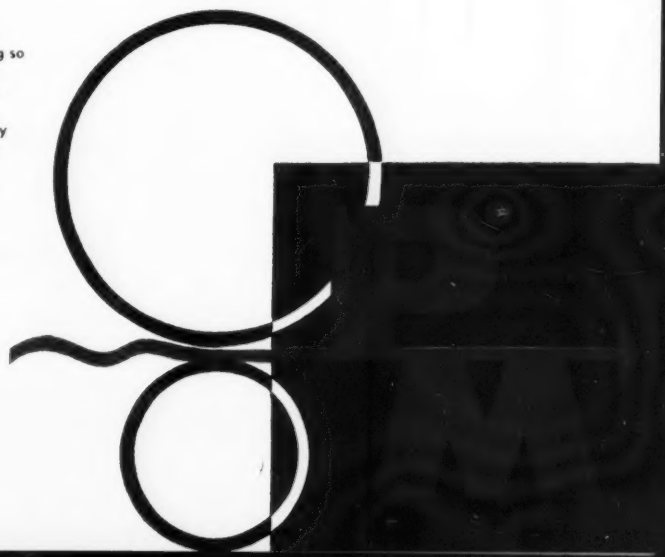
PM lines are built to fit the user's needs. To survey your needs, and determine the best answer for your requirements, make use of the first step in *PM Productioneering**, a talk with the PM man.

You will learn from him that PM Productioneered lines include heavy duty equipment (to handle up to ¼" gage steel); lines designed for lighter gages down to .002"; lines that handle a variety of metals including steel, stainless, aluminum, brass, copper; lines for a full range of coil weights up to largest handling by mills . . . Some are highly automated. Some are specially designed to fit difficult layout situations in crowded plants. Component parts of these lines are standard, but the flexibility of Productioneering tailors each line to the specific situation.

Flexibility in meeting individual needs makes PM lines differ, but PM Productioneering puts one common denominator into all PM products—maximum profits for the owner. Get in touch with a PM man today — there's no obligation.

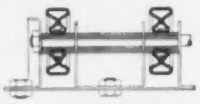
Production Machinery Corporation
Mentor, Ohio

***PRODUCTIONEERING** is the P/M way of working so engineers who supervise equipment designing have first-hand knowledge of problems encountered by sheet and strip processing line users. In working with P/M you work with responsible engineers who apply their skill to solve your problems.



Pickling Lines
Slit Coil Banding Equipment
Shearing and Cut-to-Length Lines
Grinding and Scouring Lines
Coil Build-up and Inspection Lines
Vacuum Handling Equipment
Continuous Lines for Annealing, Coating, Grit Blast Cleaning, Leveling and Miscellaneous Sheet and Strip Processing.

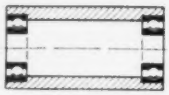
F-M Spacers Save Money in Hundreds of Applications. Spacers shown in Red



Cross member dividers on conveyor sections.

Motor mount bolt sleeve spacer.

Control rod spacers.



Before and after: Two spacers replace undercut machined wheel hub

Leaf spring bolt spacer.

Spacer-stabilizer linkage.

SAVE

Time, Money, Materials with Rolled, Split SPACER TUBES

Spacers can effect savings in many manufacturing and assembly operations—from automobiles to pull toys, phonographs to corn pickers. Furnished to your exact dimensions, ready to assemble, they are an economical substitute for iron pipe, tubing or machined parts; eliminate costly cut-off and de-burring machine time; save on secondary operations such as slots, holes, notches and chamfers. In steel, aluminum and stainless. Plain or plated. Many lengths, diameters and wall thicknesses. Complete engineering service.

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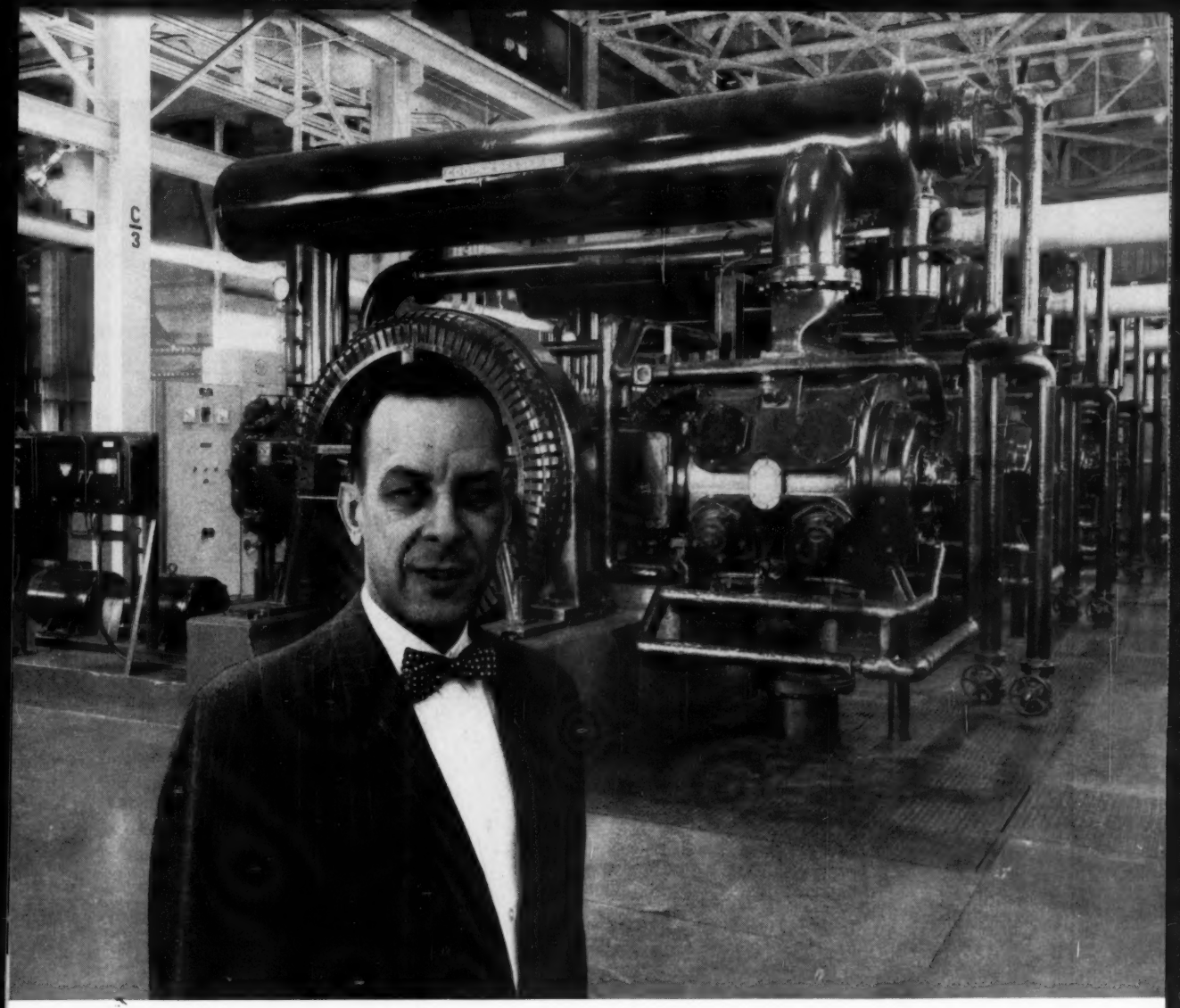

Grover H. Detmer, *Project Engineer,*
The Cooper-Bessemer Corporation, explains...

How Cooper-Bessemer compressors supply air for Ford assembly

Compressed air plays an important part in the production operations of the new Ford assembly plant in Lorain, Ohio. Behind this supply, you'll find four 400 hp Cooper-Bessemer compressors with En-Tronic controls. Housed in the power plant building, these units discharge at 104 lbs. pressure. Mains of 8" size carry the air about 1000 feet to the far ends of the huge plant. Pressure there is 98 lbs. The 5-step capacity controls automatically load the compressors to meet plant demands for air.

The Cooper-Bessemer equipment has been in use constantly since the plant was completed a year ago and have given excellent service.

Cooper-Bessemer M-line compressors for industrial air supply are available in sizes from 200 to 10,000 hp. Write for free copy of Bulletin M-81, "Air for Industry."

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ENGINE OR MOTOR DRIVEN

HOT SPOT in *your* plant?

Chances are 1 in 3 that your plant will have an electrical fire this year. Here's how to guard against it.

In a recent nationwide industrial survey, 29% of the reporting plants had one or more electrical fires during the past two years. Best protection against larger electrical fires? Install a fully-automatic Kidde carbon dioxide fire extinguishing system.

Finest fire protection on the market today, Kidde systems give you 24-hour-a-day protection, act quickly, dependably at the first sign of fire. Kidde systems are pressure-operated, self-contained – need no outside power. Visual indicators show if system is "set" or "released." All parts can be tested without discharging system. No parts to replace after operation or test. All operating parts completely enclosed for safety. Fast, clean carbon dioxide snuffs fire in seconds, then vanishes. Leaves no mess to clean up later, can't harm electrical gear. For more information, write for Kidde's Pressurized Systems booklet today.

Kidde (K Kidde) **Walter Kidde & Company, Inc.**
560 Main St., Belleville 9, N. J.

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LETTERS TO THE EDITORS

STEEL Boosts Spirit, Ambition

Thank you for including me in your distribution of timely STEEL magazine. I enjoy the completeness and apt material.

A small businessman, due to lack of management, efficiency, and work force, finds himself falling behind the eight ball in completeness. Your magazine gives him a tremendous boost in spirit and ambition to be like the great successes portrayed in STEEL.

Herman C. Schiebout
Schiebout Mfg. Co.
Grand Rapids, Mich.

Seeks to Measure Productivity

Please send me a reprint of "Productivity . . . Ways to Measure It," (Apr. 20, p. 47).

I would like to develop some method for measuring productivity for our plant, and your article was most interesting.

Would you also tell me the address of the National Bureau of Economic Research?

Don L. Geeson
Plant Industrial Engineer
Reynolds Metals Co.
Listerhill, Ala.

• *The address is 261 Madison Ave., New York 16, N. Y.*

• • •

This article was most interesting and enlightening. May I have a copy?

A. G. Stevens
Plant Superintendent
Ithaca Gun Co. Inc.
Ithaca, N. Y.

• • •

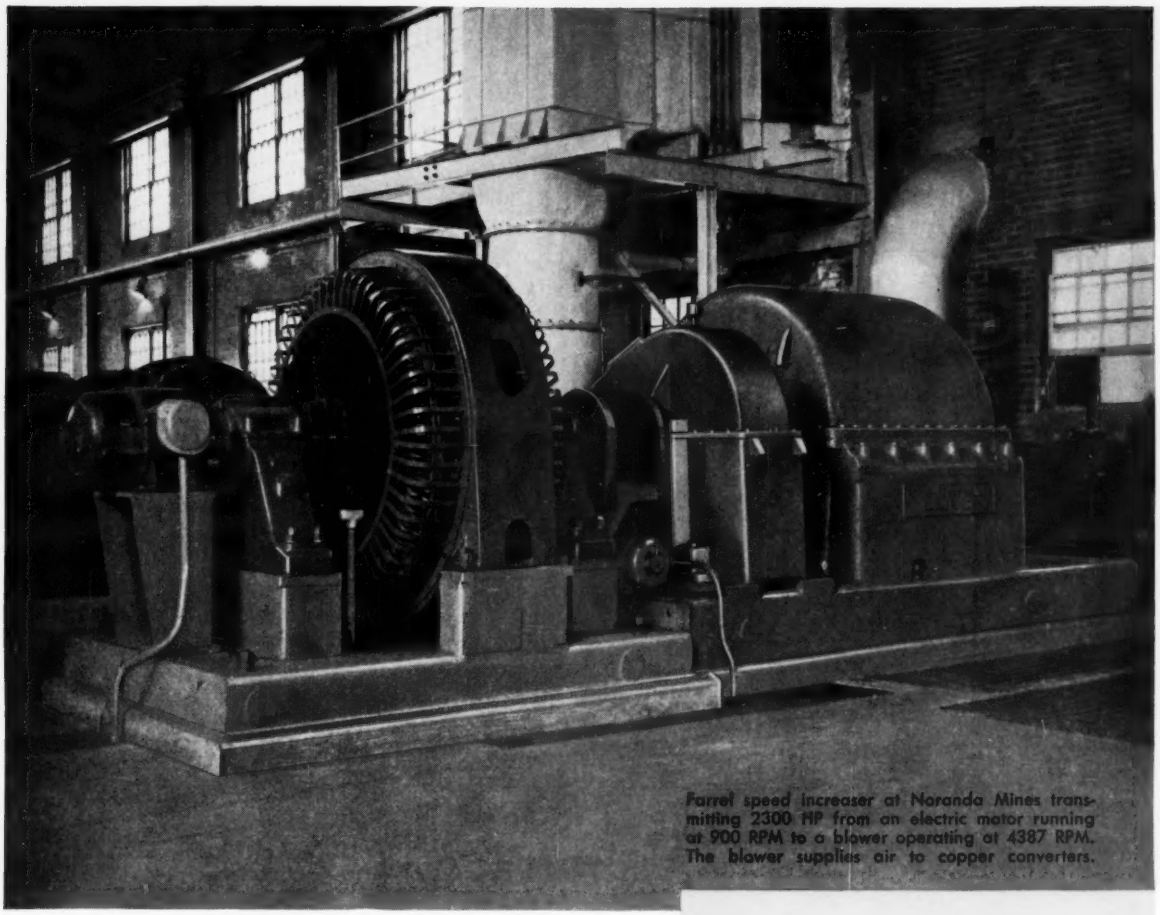
Will you send me a copy of this interesting article?

Karl G. Nowak
Factory Superintendent
Fenwal Inc.
Ashland, Mass.

Advocates Bracket System

We have been most interested in the series of articles on depreciation reform

(Please turn to Page 12)



Farrel speed increaser at Noranda Mines transmitting 2300 HP from an electric motor running at 900 RPM to a blower operating at 4387 RPM. The blower supplies air to copper converters.

"Both speed increasers have given us very satisfactory service"

NORANDA MINES, LTD.

These are the words of L. O. Cooper, plant engineer for Noranda Mines, Limited, Noranda, Quebec. He is referring to their two Farrel gear units, used to transmit power from electric motors to high-speed blowers.

Farrel gear units have the benefits of sound engineering, skilled workmanship, high quality materials and years of experience in furnishing speed increasing units which have provided "very satisfactory" service for an indefinite period. In fact, since they were first developed in 1932, not one has ever been known to be replaced.

For full details of Farrel speed increasers, send for a copy of bulletin 451.

FARREL-BIRMINGHAM COMPANY, INC.
ANSONIA, CONNECTICUT

Plants: Ansonia and Derby, Conn., Buffalo and Rochester, N. Y.
Sales Offices: Ansonia, Buffalo, Boston, Akron, Ann Arbor (Mich.), Chicago, Minneapolis, Los Angeles, Salt Lake City, Tulsa, Houston, Fayetteville (N. C.)
European Office: Piazza della Republica 32, Milano, Italy

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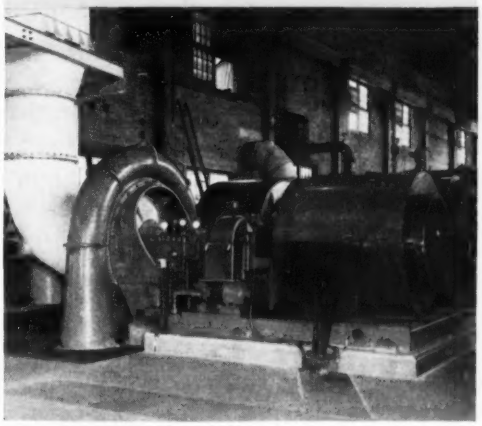


This 920 HP unit increases speed from 1450 to 4087 RPM. The blower furnishes secondary air to a copper reverberatory furnace.

FB-1160

In Dust Collection Systems...

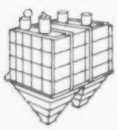
SF Precipitator at a steel plant.

design makes the difference

Higher efficiency of Buell 'SF' Electric Precipitators is the result of exclusive engineering features. For example, Buell's *Spiralectrodes* emit 50% to 100% more electrons than other types . . . and *maintain* their efficiency. Positive gas flow control through adjustable baffles prevents scouring and eddying. And Buell's Unique Continuous Cycle Rapping practically eliminates "puffing".

BUELL CYCLONES

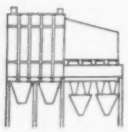
Lower installation cost of Buell's time-proved simplified design makes erection faster and easier. Spiralectrodes, for example, are self-tensioning, require no weights. Flexibility of power supply means easier installation, operating safety.



"SF" ELECTRIC PRECIPITATORS

Lower maintenance cost is the result of many details of superior design. And sectionalized design permits shutting down part of a unit without interrupting service in the rest of the unit.

Get full information: write for a copy of "Buell SF Electric Precipitators", a 22-page booklet. Write to Dept. 26-E, Buell Engineering Co., Inc., 123 William Street, New York 38, N. Y.



PRECIPITATOR-CYCLONE COMBINATIONS

buell®

Experts at delivering Extra Efficiency in

DUST COLLECTION SYSTEMS

LETTERS

(Concluded from Page 10)

which you have run in recent weeks. And, we are desirous of helping in the drive for concerted action which you are spearheading.

In our case, we strongly advocate adoption of the bracket system (Mar. 16, p. 66). If the spread of depreciation rates were fairly wide in each bracket, with a maximum at least double that of the highest rate allowed by Bulletin F for the shortest lived item in the category, the following benefits would seem to accrue:

1. Except where an unusual situation would require a rate not in the bracket, there would no longer be the burdensome conferences and litigations over depreciation rates.

2. The uncertainties of government opinions on management financial decision in this area would be eliminated.

3. It would provide a tool for prudent management to tailor its depreciation policy to fit the particular circumstances of realistic obsolescence, manufacturing activity, and expansion goals that it encounters each year.

4. It would materially reduce the expense of keeping records to substantiate taxpayers' useful lines, and government audit time.

Paul L. Smith

Secretary and Treasurer
Bullard Co.
Bridgeport, Conn.

Dear Acton Chance:

Re: The Case of the Vanishing Jobs! (Apr. 6, p. 99)

Is it possible your investigation is not complete? What is the possibility that jobs have been created by the return of our dollars in export goods? What happens to the dollars we spend outside this country? An article giving facts and figures exposing the return of the dollar should be most interesting.

C. E. Harrington Jr.

Engineer
Dunn Welding Co. Inc.
Buffalo

Binder Area?

Will you send me a copy of "How to Cut Finishing Cost 10 Per Cent" (Mar. 30, p. 44)?

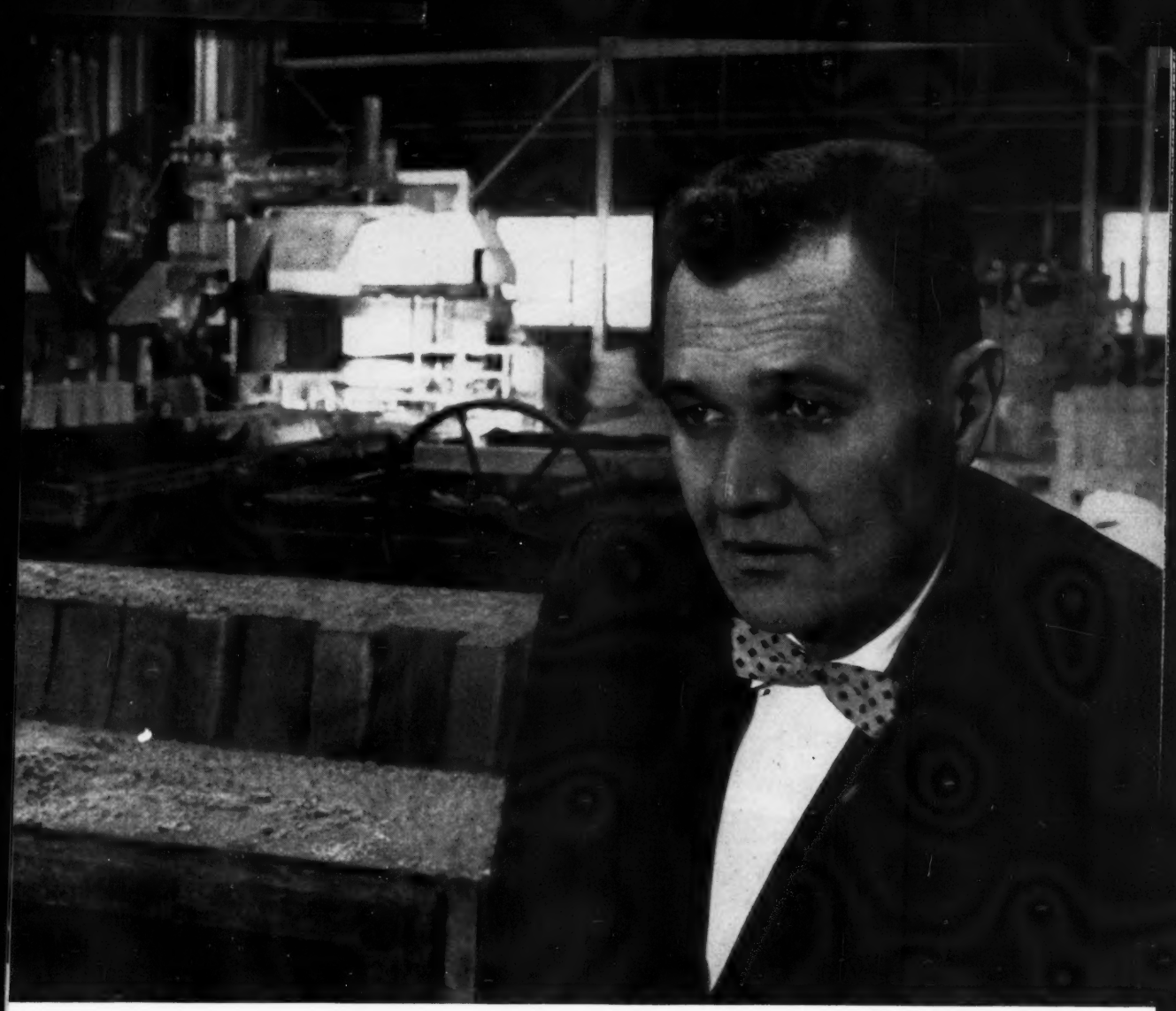
I did not, however, understand the statement, "Do you try to design your dies so all breaks or initial draws come in binder areas? Binders must be hard enough to minimize wear."

Will you clarify this for me?

Fred Boham

Tool Designer
Lawn-Boy Div.
Outboard Marine Corp.
Lamar, Mo.

• *"Binder area" is a generic term peculiar to the automotive industry. The binder area is the area of the draw ring face which retards and controls the flow of metal in a die.*



'If you have a rolling problem, call National,"

says John Patton, Assistant Manager—Roll Sales

"... we believe we can contribute to its solution. Our organizational backbone is 'men'—men, trained and experienced in metallurgy and foundry practice who take an individual interest in each problem and its solution ... just as they take an individual interest in the production of each roll that goes through our plant.

"For instance, every steel roll order is individually processed with careful planning and meticulous checking of each detail. Our wide range of furnace sizes permits pouring each order from an individual heat.

"Chilling of each mold is carefully calculated to insure deep penetration for maximum life and high resistance to firecrack and spalling.

"This same care is followed throughout production—through heat-treating, machining, testing, inspecting and shipping.

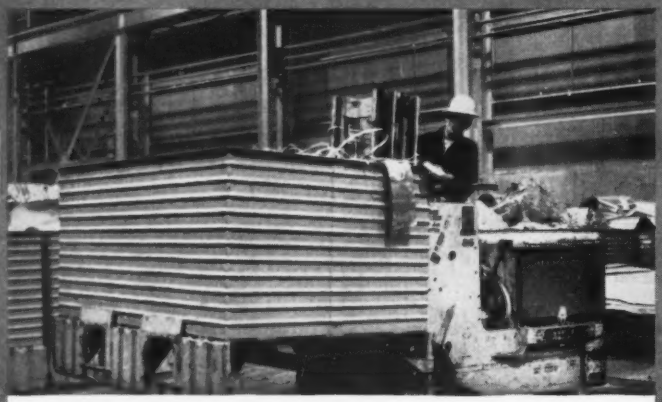
"So we repeat, 'If you have a rolling problem, call us. Let us help you solve it.'"

GENERAL STEEL CASTINGS

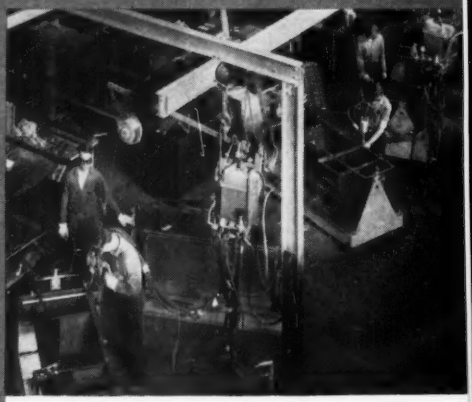
National Roll & Foundry Division

Avonmore (Westmoreland County) Pennsylvania

General Steel Castings Corporation: General Offices, Granite City, Ill.
Plants: Granite City, Ill.—Eddystone, Pa.—Avonmore, Pa.



REPUBLIC STEEL BOX AND SKID UNITS are performing double duty at Kaiser Aluminum & Chemical Corporation's new Ravenswood, West Virginia Works. Designed for 8000 lb. load capacity, these units were built by Republic's Berger Division. Talk over your handling-storage problems with a Republic Specialist. Call your nearest Republic representative or write direct today.



REPUBLIC'S BERGER DIVISION CONTRACT FACILITIES can help solve your fabricating and assembly problems. Take worry out of your production problems. Write today, let a Republic representative review Republic's facilities with you.

mark of a good place to work...

REPUBLIC STEEL LOCKERS

It's so easy to improve employee relations with clean, attractive dress-wash-and-change facilities planned around Republic Steel Lockers.

Republic Steel Lockers offer industrial management decided advantages in service and economy. Big and roomy . . . interiors are spacious, well-designed for convenience and good ventilation. Strong and sturdy . . . made of steel to assure complete protection of personal effects and tools. Heavy-duty hooks and hardware are the best obtainable.

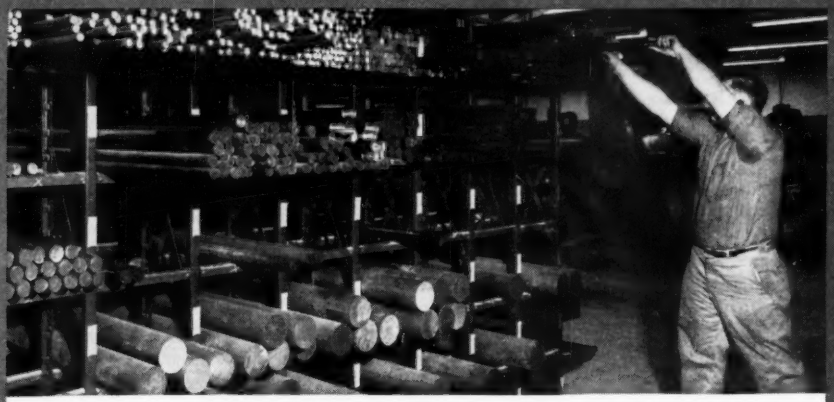
Republic Steel Lockers are *Bonderized*. This exclusive Republic feature provides a superior base for the baked enamel finish. Offers protection against rust and corrosion . . . restricts bumps, scratches, abrasions of everyday service to the site of the injury. And reduces maintenance costs to a minimum.

Republic Steel Lockers are available with any of the popular locking devices including the new fully chrome-plated foolproof Locker Handle that operates with fingertip control. Padlocks cannot be hung through loop handles without locking the locker. Handle is attached with a tamper-free Gulmite screw and lockwasher. No need to worry about pilferage.

And Republic's Berger Division Planning and Engineering Service will help you with your locker planning. They will recommend the right locker for the job and assume full responsibility for complete installation.

Help your employees start their day and end their day with a good feeling about your company. Get the best locker facilities at the lowest possible cost—specify Republic Steel Lockers.

CALL YOUR REPUBLIC REPRESENTATIVE, OR WRITE...



REPUBLIC WEDGE-LOCK LONG PARTS STORAGE UNITS are easy to load and unload from either side. The heavier the load, the tighter the grip because Wedge-Lock construction includes the three prime essentials of good shelving: 1. a post that will not bend, 2. a reinforced shelf that does not sag; and 3. a concealed sway-proof joint. Republic's Berger Division offers a complete line of shelving, storage units, and shop equipment to meet your needs. Republic Engineering Specialists help you plan. Write today.

REPUBLIC STEEL CORPORATION
DEPT. 51-7574
1441 REPUBLIC BUILDING • CLEVELAND 1, OHIO

Please send information on the following Republic products:
☐ Republic Steel Lockers ☐ Wedge-Lock Storage Units
Please have representative call to discuss:
☐ Materials Handling Equipment ☐ Contract Facilities

Name_____ Title_____
Company_____
Address_____
City_____ Zone____ State____

REPUBLIC STEEL

World's Widest Range of Standard Steels and Steel Products

COMPLETE

QUALITY CONTROL

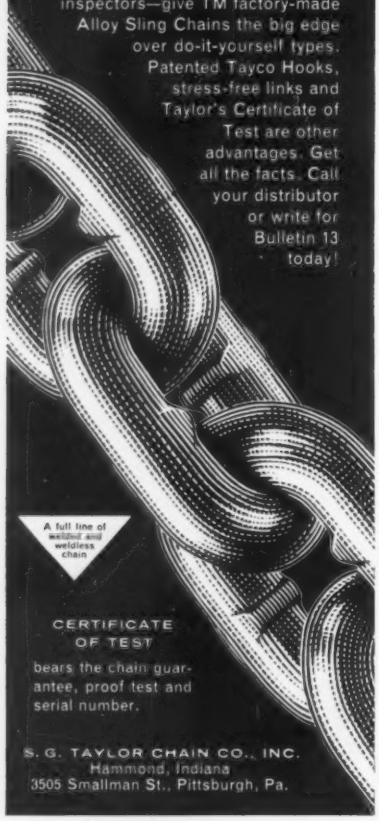
another advantage of

TM

factory-made

alloy sling chains!

Taylor's well-known quality control —gamma ray testing . . . controlled heat-treating . . . professional inspectors—give TM factory-made Alloy Sling Chains the big edge over do-it-yourself types. Patented Tayco Hooks, stress-free links and Taylor's Certificate of Test are other advantages. Get all the facts. Call your distributor or write for Bulletin 13 today!



A full line of welded and weldless chain

CERTIFICATE OF TEST

bears the chain guarantee, proof test and serial number.

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3505 Smallman St., Pittsburgh, Pa.

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The Metalworking Weekly

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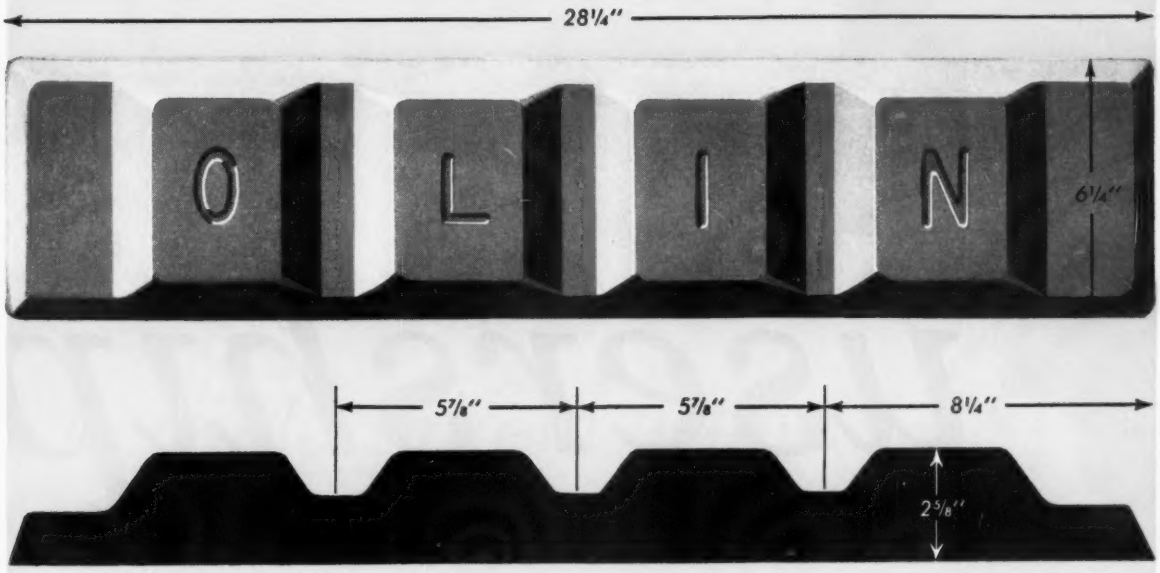
YOU'LL FIND GOLD
IN THIS NEW 25 POUND OLIN ALUMINUM INGOT!



Now, a 25 pound ingot from Olin Aluminum. Consider its advantages for you!

Smaller size. Easier to store, easier to gauge metal supply for closer control.

Lighter weight. 25 lbs. vs. 30 lbs. Greatly increases handling efficiency.

Deeper notches. Easier to break. Saves time, eases work load.

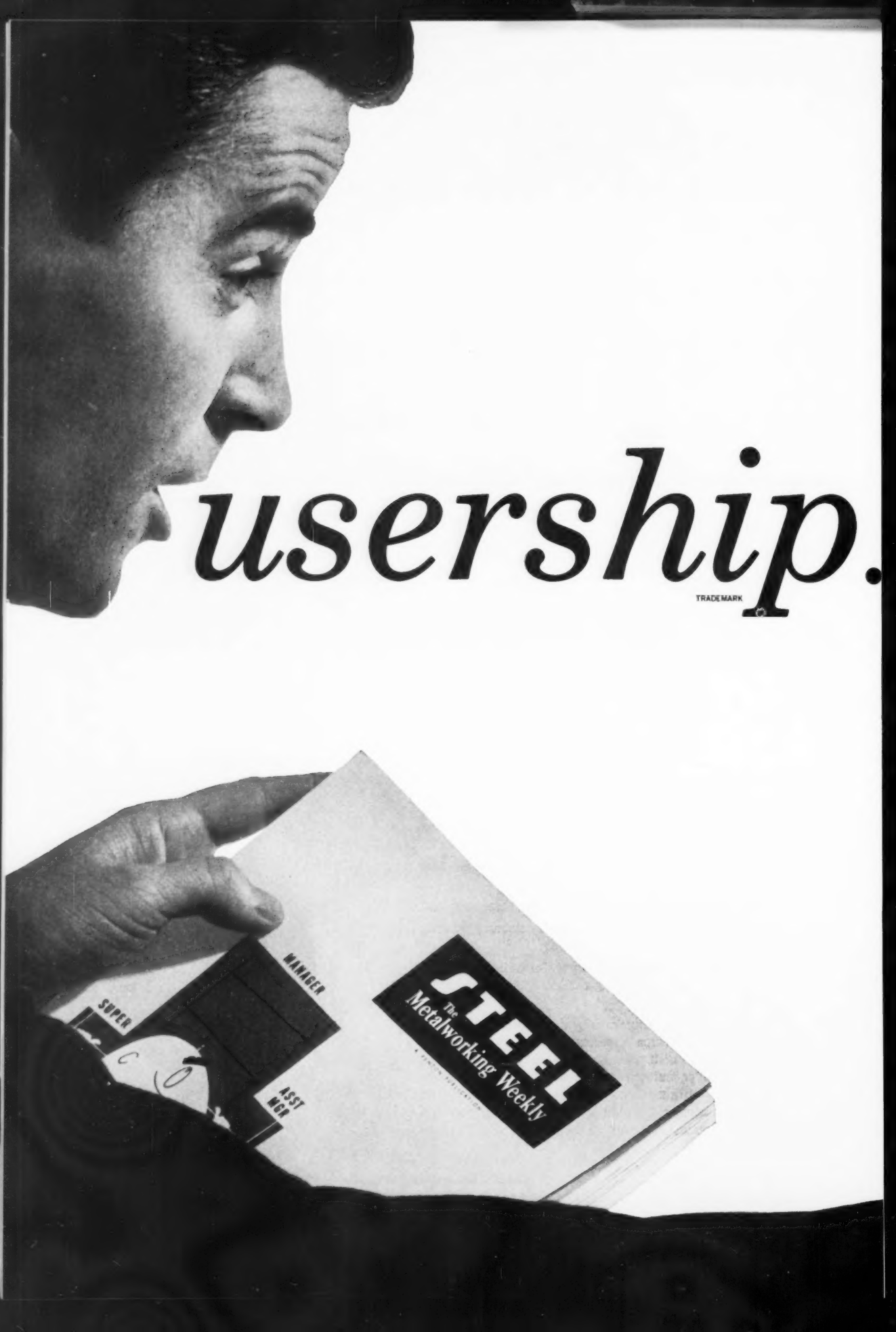
More sections. 3 notches, 4 sections vs. 2 notches, 3 sections. Reduces waste.

Same price per pound as 30 lb. ingot. Olin Aluminum is the only prime supplier producing a 25 pound ingot, and at no additional cost.

America's new major aluminum producer, Olin Aluminum, is also the newest source of profitable ideas for foundrymen. Take advantage of it. Contact your nearby Olin Aluminum Sales Office or Authorized Distributor of casting alloys. Ask for our pig and ingot technical data bulletin. Metals Division—Olin Mathieson Chemical Corporation, 400 Park Avenue, New York 22, New York.

OLIN ALUMINUM

Symbol of New Standards of Quality and Service in the Aluminum Industry


usership.
TRADEMARK
MANAGER
SUPER
ASST MGR
STEEL
The Metalworking Weekly

. . . *is readership-in-action*

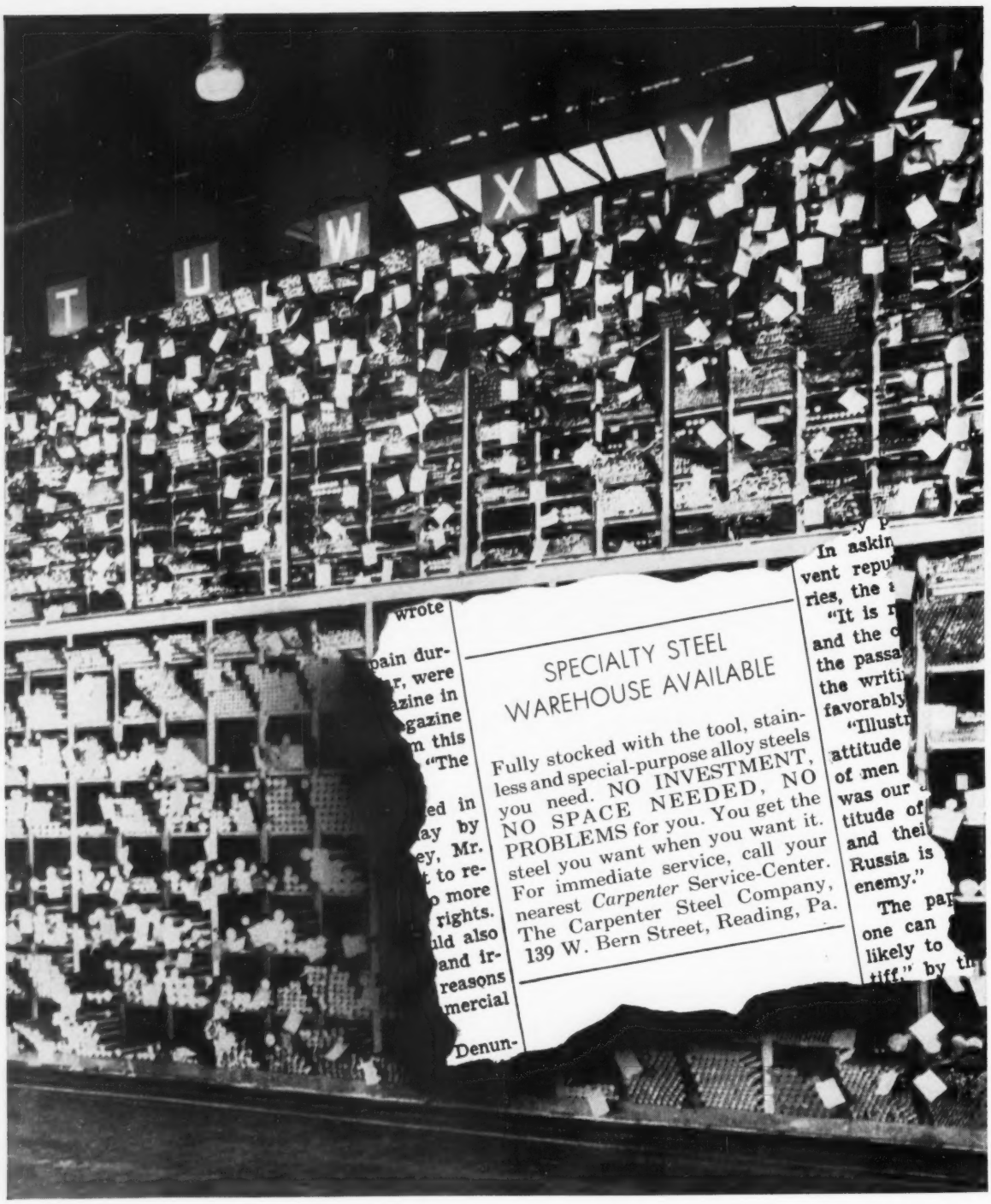
Usership is the step beyond readership. It sums up the dynamic power to move readers to action that is the life-force of an exciting and influential magazine.

STEEL is metalworking's *Usership* magazine. It serves the needs of metalworking's action-minded leaders as no other magazine does. And because STEEL serves these men so well, they *use* STEEL—base direct business action on what they read.

STEEL's report on "value analysis", for example, touched off a series of management meetings and discussions throughout metalworking.

Usership is also the measure of a magazine's ability to get action for advertisers. That is why today more advertisers are placing more advertising in STEEL than any other metalworking magazine.

usership is the strength of STEEL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WAREHOUSE AVAILABLE
Fully stocked with the tool, stainless and special-purpose alloy steels you need. NO INVESTMENT, NO SPACE NEEDED, NO PROBLEMS for you. You get the steel you want when you want it. For immediate service, call your nearest *Carpenter* Service-Center. The Carpenter Steel Company, 139 W. Bern Street, Reading, Pa.

Carpenter STEEL

mill-branch warehouse service

mill-branch warehouses, offices and distributors in principal U.S. cities consult your local telephone directory

POSITIVE DUPLICATION – EVERY TIME!

(PD) ° Distinctive bullet markings occur every time a bullet leaves the same gun barrel. The barrel rifling grooves the slug, making possible *positive identification*—an important contribution to the science of ballistics.

WHEELS MATCHED TO MACHINE

Just as a bullet is matched to a gun barrel, so CINCINNATI (PD) CENTERLESS WHEELS (like those shown above) are matched to your centerless grinding jobs. Thirty-five years of centerless grinding experience back up each application of CINCINNATI (PD) WHEELS to your operation.

PRECISION PERFORMANCE

And every time—time after time—when you reorder a CINCINNATI (PD) WHEEL, it will act and grind exactly like the original. The Positive Duplication of wheel grades by the remarkable (PD) manufacturing process *will help maintain your production*—and save you both time and money.

Whatever CINCINNATI (PD) WHEEL you specify . . . centertype, centerless, internal, surface, toolroom, or snagging wheel . . . you get Positive Duplication—every time!

APPLICATION BY SPECIALISTS

Here's another advantage for you. Each one of our factory representatives is a highly trained and experienced specialist in grinding machine set-ups and operations. For his help on those extra-tough grinding problems, call your CINCINNATI (PD) GRINDING WHEEL distributor, or contact Cincinnati Milling Products Division, Cincinnati 9, Ohio.

(PD) POSITIVE DUPLICATION

CINCINNATI°

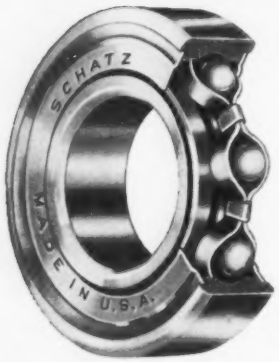
GRINDING WHEELS

° Trade Mark Reg. U. S. Pat. Off.

A PRODUCTION-PROVED PRODUCT OF THE CINCINNATI MILLING MACHINE CO.

Name your load and speed combinations...

Schatz makes the most varied line of Ball Bearings to fit your needs



"Functional Precision" Ball Bearings—BR series

One piece race type with ball cage. Designed to give all the precision you require under certain ratios of load, speed and life expectancy. Available in open type, single or double shielded, single or double sealed with Schatz patented low friction plastic seal. Or with one shield and one seal on special order.

23 sizes from 3/16" to 1"—6 types in each size + specials

"Commercial" Ball Bearings

The most complete and varied line anywhere.

UNGROUND BALL BEARINGS "TYPE A"—Every standard type—radial, thrust and radial thrust.

GROUND BALL BEARINGS "TYPE B"—Used and recommended where greater accuracy and smoother running qualities are needed and where loads are heavier and speeds higher.

1033 sizes to match your Bearing Application Needs

FILL IN AND MAIL

We'll fit these bearings—or special types and sizes to your special needs. Just fill in your application problem below—attach to your letterhead and mail.

THE SCHATZ MANUFACTURING COMPANY, Poughkeepsie, N. Y.
Here's our bearing problem. What do you suggest?

APPLICATION_____

LOAD (radial, thrust or both)_____

SIZE_____

SPEED_____

LIFE FACTOR_____

OPERATING CONDITIONS_____

SPECIAL CONDITIONS_____

Name_____ Title_____

Company_____

Address_____

City_____ Zone____ State_____

SCHATZ
BALL BEARINGS

CALENDAR
OF MEETINGS

May 17-20, Industrial Heating Equipment Association: Spring meeting, Homestead Hotel, Hot Springs, Va. Association's address: Associations Bldg., Washington 6, D. C. Secretary: Robert E. Fleming.

May 20-22, American Management Association: General management conference, Roosevelt Hotel, New York. Association's address: 1515 Broadway, New York 36, N. Y. General management division's manager: David J. Secunda.

May 20-22, Electronic Industries Association: Annual meeting, Sheraton Hotel, Chicago. Association's address: 1721 DeSales St. N.W., Washington 6, D. C. Secretary: James D. Secrest.

May 20-22, Society for Experimental Stress Analysis: Spring meeting, Sheraton-Park Hotel, Washington. Society's address: P. O. Box 168, Cambridge 39, Mass. Secretary-treasurer: W. M. Murray.

May 21-22, National Industrial Conference Board Inc.: General session for all associates and annual meeting, Waldorf-Astoria Hotel, New York. Board's address: 460 Park Ave., New York 22, N. Y. Secretary: Herbert S. Briggs.

May 25-26, Malleable Founders' Society: Annual meeting, Homestead Hotel, Hot Springs, Va. Society's address: 1800 Union Commerce Bldg., Cleveland 14, Ohio. Executive vice president: Lowell D. Ryan.

May 25-26, Wire Reinforcement Institute Inc.: Annual meeting, Greenbrier Hotel, White Sulphur Springs, W. Va. Institute's address: National Press Bldg., Washington 4, D. C. Managing director: Frank B. Brown.

May 25-27, American Society for Quality Control: Annual meeting and exhibit, Sheraton-Cleveland Hotel and Public Auditorium, Cleveland. Society's address: 161 W. Wisconsin Ave., Milwaukee 3, Wis. Administrative secretary: W. P. Youngclaus Jr.

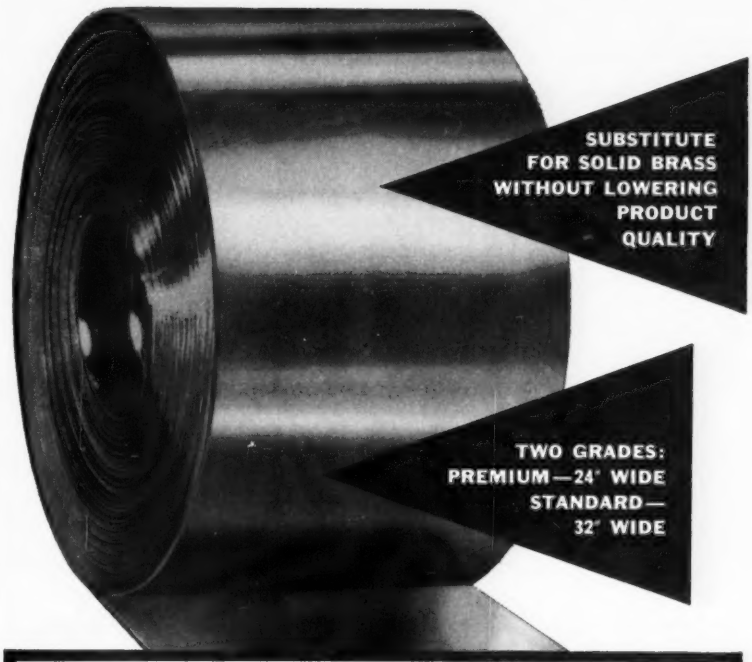
May 25-28, Design Engineering Show & Conference: Convention Hall, Philadelphia. Information: Clapp & Poliak, 341 Madison Ave., New York 17, N. Y.

May 25-30, Concrete Reinforcing Steel Institute: Annual meeting, Greenbrier Hotel, White Sulphur Springs, W. Va. Institute's address: 38 S. Dearborn St., Chicago 3, Ill. Managing director: H. C. Delzell.

May 27-28, American Iron & Steel Institute: Annual meeting, Waldorf-Astoria Hotel, New York. Institute's address: 150 E. 42nd St., New York 17, N. Y. Secretary: George S. Rose.

May 27-29, National Fluid Power Association: Spring meeting, Grove Park Inn, Asheville, N. C. Association's address: 1618 Orrington Ave., Evanston, Ill. Executive vice president: Barrett Rogers.

NEW PRE-FINISHED BRASS-STEEL SAVES 25% OR MORE ON MATERIAL COSTS



Combines the Decorative Properties of Brass With the Economy of Steel

Where the only BRASS you *need* is the brass you *see*, save 25 percent or more on material costs, reduce production steps with brass-plated steel. This way, the only BRASS you pay for is the substantial brass coating you *really need*. Big 32" wide coils — the widest ever made — in Standard grade, for utility or decorative uses; 24" wide in Premium grade, our finest quality — an economical substitute for pure brass for many applications. Both grades are sealed with BAKEKOTE, a baked resin film. Mar-Not protective coating protects the pre-finished surface during fabrication. Big 24" and 32" wide coils and sheets — bright and satin finishes and crimps. Also stripes in sheets, only.

UNPOLISHED — For those parts designed beyond the fabrication limits of our regular pre-finished material, consider *unpolished* Brass-Steel. Excellent for post-finishing work or for applications where high surface finish is not required.

SEE NICKELOID—BOOTH 1603
Design Engineering Show
Philadelphia Convention Hall—May 25-28

NICKELOID METALS SINCE 1898 N·M

AMERICAN NICKELOID COMPANY
PERU 1, ILLINOIS

Mills: Peru, Ill. and Walnutport, Pa. — Sales Offices Throughout the U.S.A.

FRASSE ALUMINUM

helps tell how she's doing!

Ballistic missile success hinges on intelligence obtained in test firings. Tracking data – reporting velocity, direction, altitude, temperature, etc. is vital – when processed, it guides critical design changes.

Heart of the intricate data processing system at Cape Canaveral is a Potter Magnityper – a high speed electronic printer that decodes raw material . . . then stores, collates, interprets and prints at 72 *thousand* characters per minute. Lightweight, non-magnetic aluminum is essential to its efficient operation – that's why the Magnityper is made almost completely of Frasse aluminum.

Frasse ships the required sizes quickly from stock – in the grades that contribute to its ease of fabrication *and* performance. For example, Frasse supplies 2024-T4 bars for *strength* and *machinability*, 5052-H34 sheet for *formability* and *weldability* and "775" tooling plate for *dimensional accuracy* with *no distortion when worked.*

Perhaps these same qualities can increase the efficiency of *your* product – or reduce fabricating costs. It's worth investigating – and a Frasse aluminum specialist will be glad to help. There's no obligation – simply write or call your nearest Frasse office. You'll be glad you did.

Call FRASSE for ALUMINUM

Screw Machine Stock • Bars • Rods • Wire Sheets • Plates • Tubing • Holobar Pipe • Fittings • Valves • Extrusions Tool and Jig Plate

Peter A. Frasse & Co., Inc.

NEW YORK 13, N. Y.	PHILADELPHIA 29, PA.	BUFFALO 7, N. Y.	SYRACUSE 1, N. Y.	HARTFORD 1, CONN.
17 Grand St.	3911 Wissahickon Ave.	P. O. Box K, Sta. B	P. O. Box 1267	P. O. Box 1949
WAlker 5-2200	BAldwin 9-9900	BEdford 4700	HOward 3-8655	JAckson 9-6861

Photo Courtesy Milwaukee Gear Company

FOR EVERY APPLICATION, THERE'S ONE CRANE OUTSTANDING...

IN HEAT-TREATING: This 5-ton P&H crane with five-step speed control puts speedy material-handling under one man's thumb. From quench furnace to quench tank to tempering furnace, this low-cost standard-built unit provides dependable load movement — despite searing oil fumes, sudden blasts of heat from open fire-pots, and punishing high temperatures.

P&H units like this one are made with all the care and quality that go into any P&H crane, and because they are constructed from stock parts, you can have one on your runway for far less than you'd expect. What's more, every P&H crane is backed by a policy of undivided responsibility for all electrical and mechanical parts. This typical P&H service assurance is one reason why satisfied customers have made P&H the world's largest manufacturer of overhead cranes.

Write for your free, file-size copy of Bulletin C-6 "Industrial Cranes." Dept. 103, Harnischfeger Corp., Milwaukee 46, Wisconsin.

OUR 75TH YEAR

P&H HARNISCHFEGER

...quality and service for 75 years

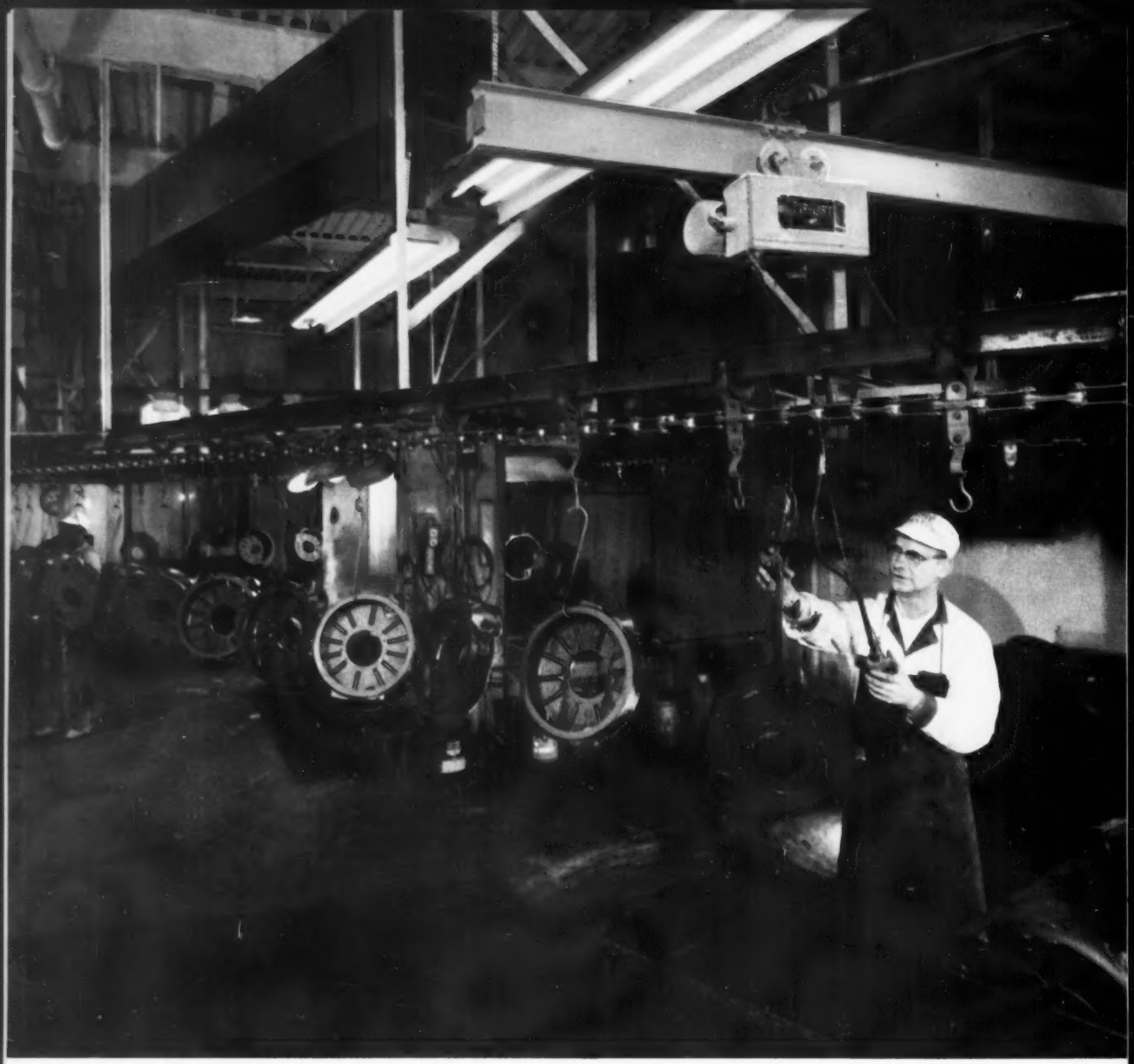


Photo Courtesy Wacho Mfg. Co.

6000 ORDERS A DAY DON'T TIRE A ZIP-LIFT!

An operator's thumb punches over 6000 commands a day into this production-line P&H Zip-Lift in a painting, coating, and tinning plant. The sturdy hoist responds promptly . . . never tires . . . and comes up asking for more.

The control pendant on a Zip-Lift operates on a safe 24-volt circuit — typical of the many safety features P&H builds into this low cost unit. There are two brakes, either of which will hold a capacity load even if power fails . . . shrouded load-block to protect workers hands . . . limit switches that guard against equipment abuse . . . and many more features that make P&H Zip-Lift hoists extra-safe and extra-dependable.

Are you guarding your personnel and your production with P&H Zip-Lifts . . . or are you going to start with your very next hoist purchase? Bulletin H20 will help you plan that purchase. It's free from Dept. 202, Harnischfeger Corp., Milwaukee 46, Wisconsin.

OUR 75TH YEAR

P&H HARNISCHFEGER

. . . quality and service for 75 years

Tubexperience in action

New High-Strength Material Extends Superior Line of Stainless Steel Tubing Analyses

PH 15-7 Mo, a new precipitation-hardening stainless steel analysis, possesses excellent mechanical properties at room temperature, outstanding ones at elevated temperatures. In addition, it is readily fabricated in the annealed condition, exhibits good corrosion resistance characteristics, can be hardened by heat treatment with minimum distortion.

Tubing of this new analysis is recommended for aircraft structural parts, studs and bushings, Bourdon springs and torque tubes in instrumentation, tubular springs, and hydraulic lines where severe bending and forming are required. It is available in WELDRAWN® form in size range from .012 through 1.125 in. OD.

In addition to PH 15-7 Mo, Superior offers the widest variety of analyses in the small-diameter tubing industry—over 120. This range permits you to specify the right one for your particular application. For complete information about PH 15-7 Mo and other analyses available for your needs, write Superior Tube Company, 2005 Germantown Ave., Norristown, Pa. *Reg. U.S. Pat. Off., Armco Steel Corp.

Superior Tube

The big name in small tubing

NORRISTOWN, PA.

All analyses .010 in. to ⅝ in. OD—certain analyses in light walls up to 2½ in. OD

West Coast: Pacific Tube Company, Los Angeles, California • FIRST STEEL TUBE MILL IN THE WEST

Fast moving Macomber.

An example of progress, Robert Macomber, president, displays one of Macomber's fine products—V-Lok structural framing that goes together without bolts, rivets, or welds.

PHOTO BY KARSH OF OTTAWA

. bases growth on advanced engineering–

Quality Steels

Quality steel is vital according to James E. Stiles, vice president of production at Macomber.

Since the war the construction industry has experienced phenomenal growth. Even so, few concerns associated with the construction business were able to record progress at the pace set by Macomber Incorporated, Canton, Ohio, manufacturer of steel joists, roof decking, and structural steel framing.

"Advanced engineering—quality product", Macomber executives agree were the main reasons for their steady drive to national prominence. "Our engineering is second to none", says Robert Macomber, president, "and we're extremely quality conscious. In this area we know we have to rely on quality minded suppliers. We like the steel from *Sharon Steel Corporation, Sharon, Pa.*"

Reliable steel service is necessary in the fast moving construction business says Norman C. McGregor, purchasing agent, shown here with Sharon salesman Lynn Houston.

The best designs result from a good knowledge of materials and faith in the supplier to deliver, says J. W. Hubler, vice president of engineering.

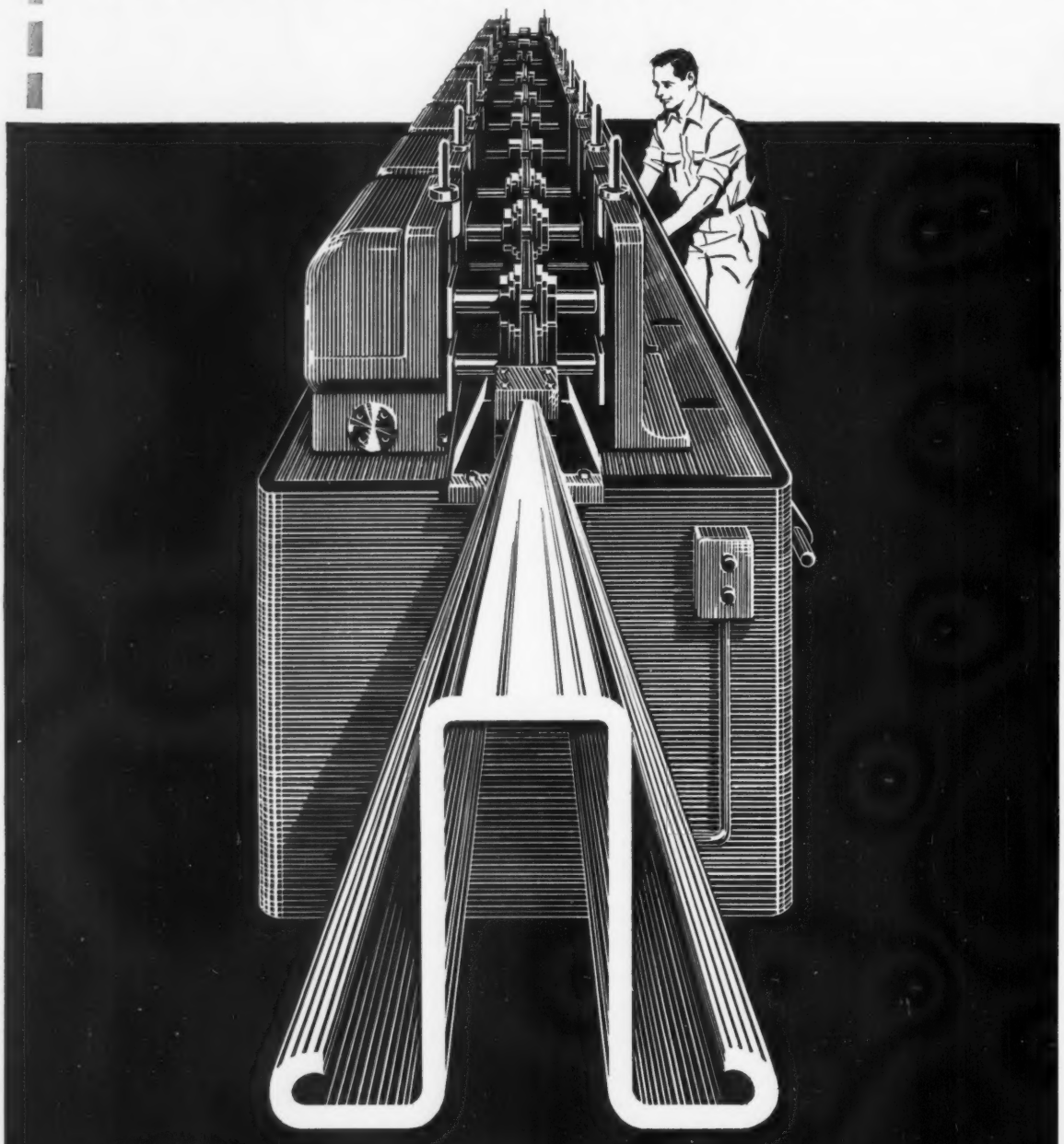
SHARON *Quality* **STEEL**

SHARONSTEEL

YODER

Roll Forming Equipment—Product dependability—integrity of manufacture—engineering for specific production needs have all contributed to establish Yoder equipment as the industry standard of excellence. Since 1909 Yoder-built machinery, including Pipe and Tube Mills, Roll Forming Equipment and Rotary Slitters, have earned world-wide customer satisfaction and recognition. Profit from Yoder's years of engineering and service experience. Send today for the illustrated Yoder Roll Forming Equipment Book.

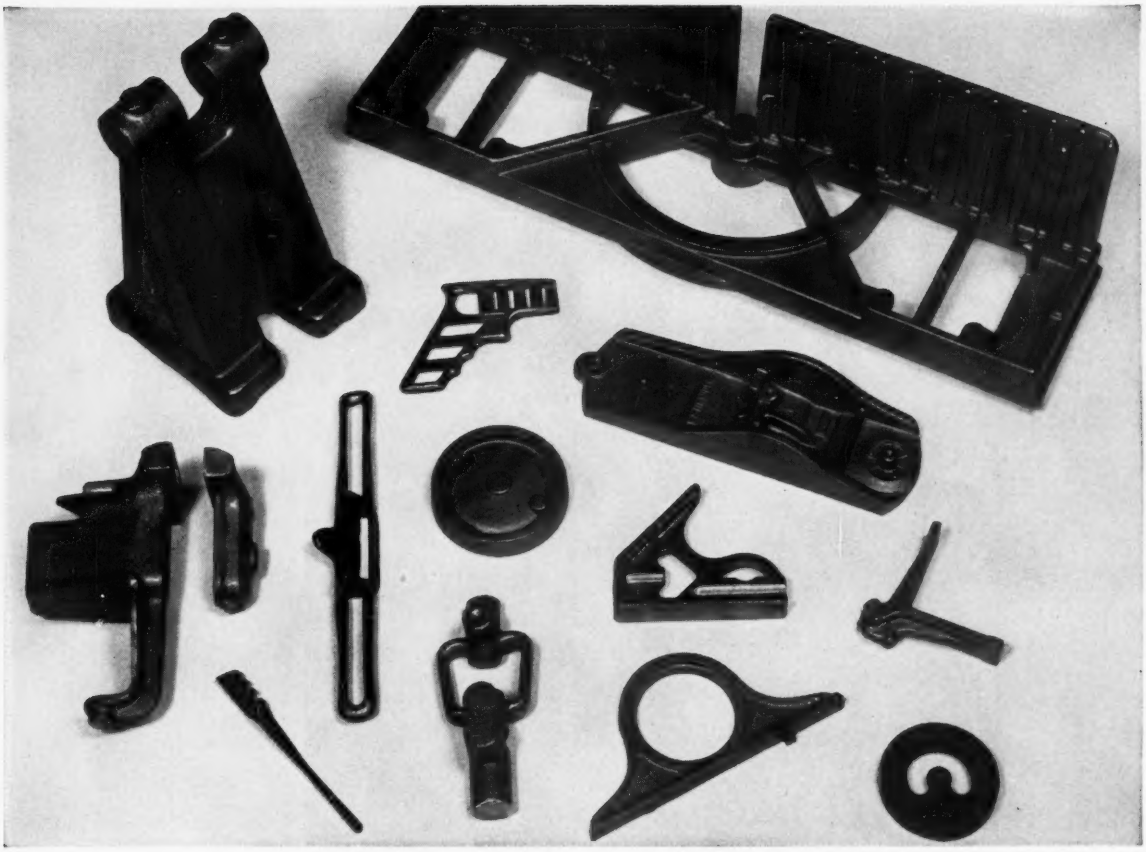
THE YODER COMPANY • 5502 Walworth Avenue • Cleveland 2, Ohio



ENGINEERING
YODER
MANUFACTURING

COLD ROLL FORMING MACHINES

PIPE AND TUBE MILLS (ferrous or non-ferrous)
ROTARY SLITTING LINES



Cast with Hanna iron, precision tool parts for jack planes, bench vises, saw handles and miter boxes require a minimum of machining because these gray iron castings are perfect and clean.

Why Millers Falls uses HANNA PIG IRON for hundreds of different precision-built tools

For more than 90 years Millers Falls Company has been manufacturing precision carpenter and machinists tools for home and industry. Some 1,500 different high quality tools are produced at the Greenfield, Massachusetts plant alone. More than 50% of the parts are made from gray iron castings containing Hanna malleable pig iron.

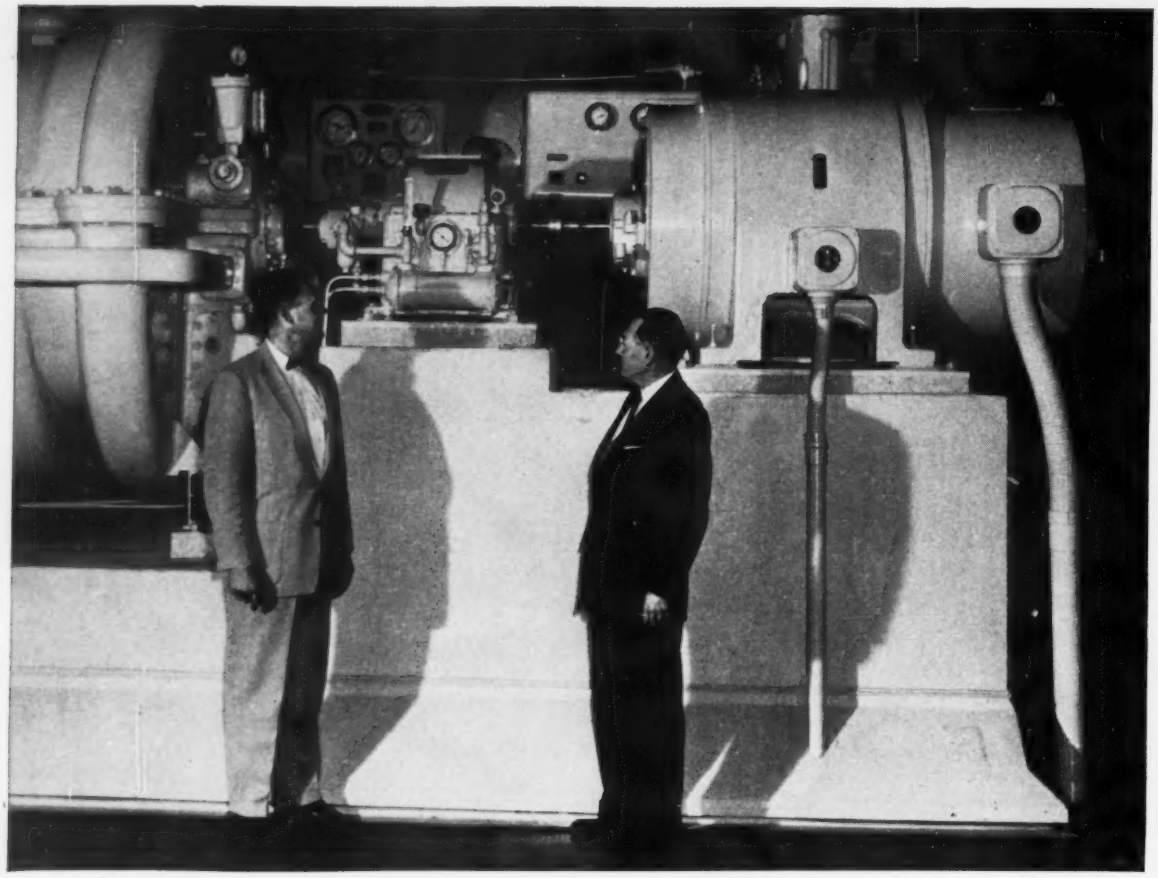
Many of these tools and tool parts require only shot cleaning before being assembled because of the close tolerance casting employed.

Quality, uniformity, strength and denseness, which are integral characteristics of Hanna pig iron, are reflected in the firm's record of perfect castings time after time.

Whatever you cast, large or small, there's a Hanna pig iron to do the job best. All regular grades, plus HANNATITE® and Hanna Silvery, are available in the regular 38-lb. pig or HANNATEN® 12½-lb. ingot. For the iron to suit your particular needs, call a trained Hanna representative for assistance.

Breaker slots on glass cutter castings require no machining. Illustration shows glass cutters immediately after shakeout.

THE HANNA FURNACE CORPORATION
Buffalo • Detroit • New York • Philadelphia
Merchant Pig Iron Division of
NATIONAL STEEL CORPORATION



One of two Fairbanks-Morse 4160 volt, 700 hp. slip ring motors which power Carrier refrigeration compressors.

8-speed climate with F-M motors!

Flexible control of new air conditioning system saves power and maintenance for Union Oil Center

Through a new Carrier dual-duct high-velocity system powered by Fairbanks-Morse slip ring motors, the magnificent new Union Oil Center in Los Angeles is ideally air-conditioned at minimum power and maintenance cost.

Providing 8 speeds between 75 and 100 percent of capacity, the two F-M 700 hp. motors make it possible to match operating rpm. of compressors, chillers and condensers to any specific condition. The new Center covers 5 acres, with 1200 employees occupying 426,000 square feet of the office space in a complex of four buildings—an installation requiring the finest in air-conditioning equipment and components.

Fairbanks-Morse offers the distinct advantage of a broad range of alternating and direct current motors, in all types, and in ratings from ½ to 10,000 hp.

For expert assistance in specifying, write Fairbanks, Morse & Co., 600 South Michigan Ave., Chicago 5, Illinois.

New Union Oil Center in Los Angeles.

FAIRBANKS-MORSE

a name worth remembering when you want the BEST

ELECTRIC MOTORS · GENERATORS · PUMPS · SCALES · DIESEL, DUAL FUEL AND GAS ENGINES · LOCOMOTIVES · COMPRESSORS · MAGNETOS · HOME WATER SYSTEMS

"We've practically eliminated off-grade heats with MANTEMP ferromanganese"

An almost foolproof way to hit open-hearth manganese specifications consistently is with ladle additions of MANTEMP ferromanganese. Mill superintendents have reported that the alloy yields high recoveries and allows substantial reductions in overall ingot costs.

Fine grain size specifications can also be met easily because MANTEMP ferromanganese does not preferentially oxidize separately added aluminum. The alloy is available in both high- and medium-carbon grades, packed in cans containing exactly 40 pounds of manganese.

UNION CARBIDE METALS COMPANY, Division of Union Carbide Corporation, 30 East 42nd Street, New York 17, N. Y.

For further information, write for this new six-page MANTEMP ferromanganese bulletin.

UNION CARBIDE METALS

Electromet *Brand Ferroalloys and other Metallurgical Products*

The terms "Mantemp," "Electromet," and "Union Carbide" are registered trade-marks of Union Carbide Corporation.

TEXACO ORGANIZED LUBRICATION CAN HELP YOU...

Get rid of the "guns" that "misfire"

His grease guns are aimed at your profits; they can help boost them—or eliminate them altogether. Here's why:

You used to need a different grease for nearly every job. That meant 20 or 30 lubricants in the plant, with the almost inevitable danger of misapplication — and damaged machinery.

Unless you're operating on the basis of a modern lubrication survey, *the chances are that this situation still exists in your plant!*

A Texaco Organized Lubrication Plan uses a minimum number of proper oils and greases—including newly developed multi-purpose lubricants—to reduce your inventory by as much as 80% and virtually eliminate this problem.

Get the details on Texaco Organized Lubrication. Contact your local Texaco Lubrication Engineer or write for "Management Practices that Control Costs via Organized Lubrication."

Texaco Inc., 135 East 42nd Street, New York 17, N. Y., Dept. S-100.

LUBRICATION IS A MAJOR FACTOR IN COST CONTROL

Accent on Excellence

Youngstown cold-rolled steel sheets

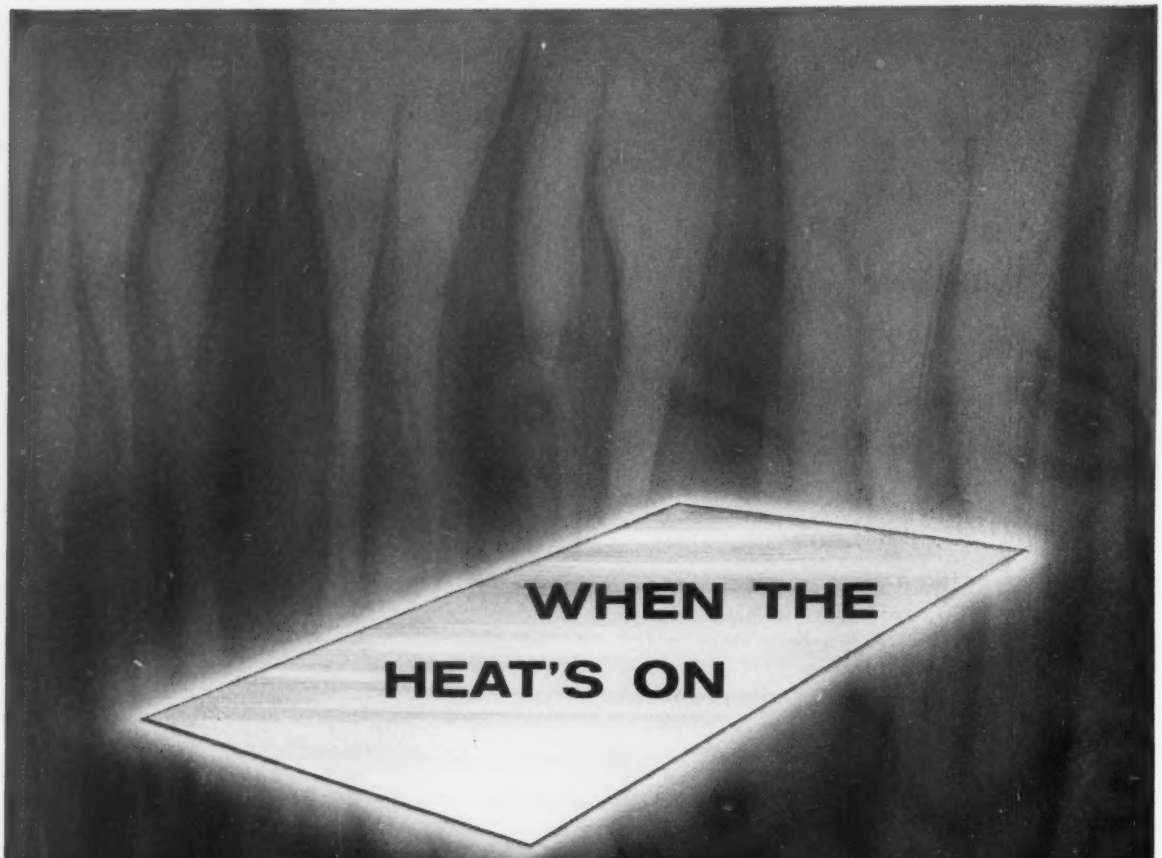
This new industrial building is getting a long-lasting, weather-resistant Galbestos roof—one that will offer optimum resistance to both fire and corrosion. It will withstand a concentrated load and an impact load as well as a uniform load.

Pittsburgh's H. H. Robertson Company fabricates their Galbestos sheeting from Youngstown Cold-Rolled Sheets. That's because they require a basic raw material that combines minimum weight with great strength—and Youngstown more than meets the specification.

Wherever steel becomes a part of things *you* make, the high standards of Youngstown *quality*, the personal touch in Youngstown *service* will help you create products with an "accent on excellence".

One of a battery of Robertson-designed corrugating machines at work fabricating Youngstown Cold-Rolled Sheets in the production of Galbestos.

Youngstown
Youngstown, Ohio
THE YOUNGSTOWN SHEET AND TUBE COMPANY
Carbon, Alloy and Yoloy Steel



. . . you need Eastern's 309 or 310 Stainless Steel

If you have a "hot" problem . . . finding metals to withstand 1200° to 2000° F . . . your answer could well be Eastern's 309 or 310 stainless. Both offer extremely high strength retention, corrosion and oxidation resistance, within this high temperature range . . . specific qualities that suggest new-use and new-product potential for many industries as well.

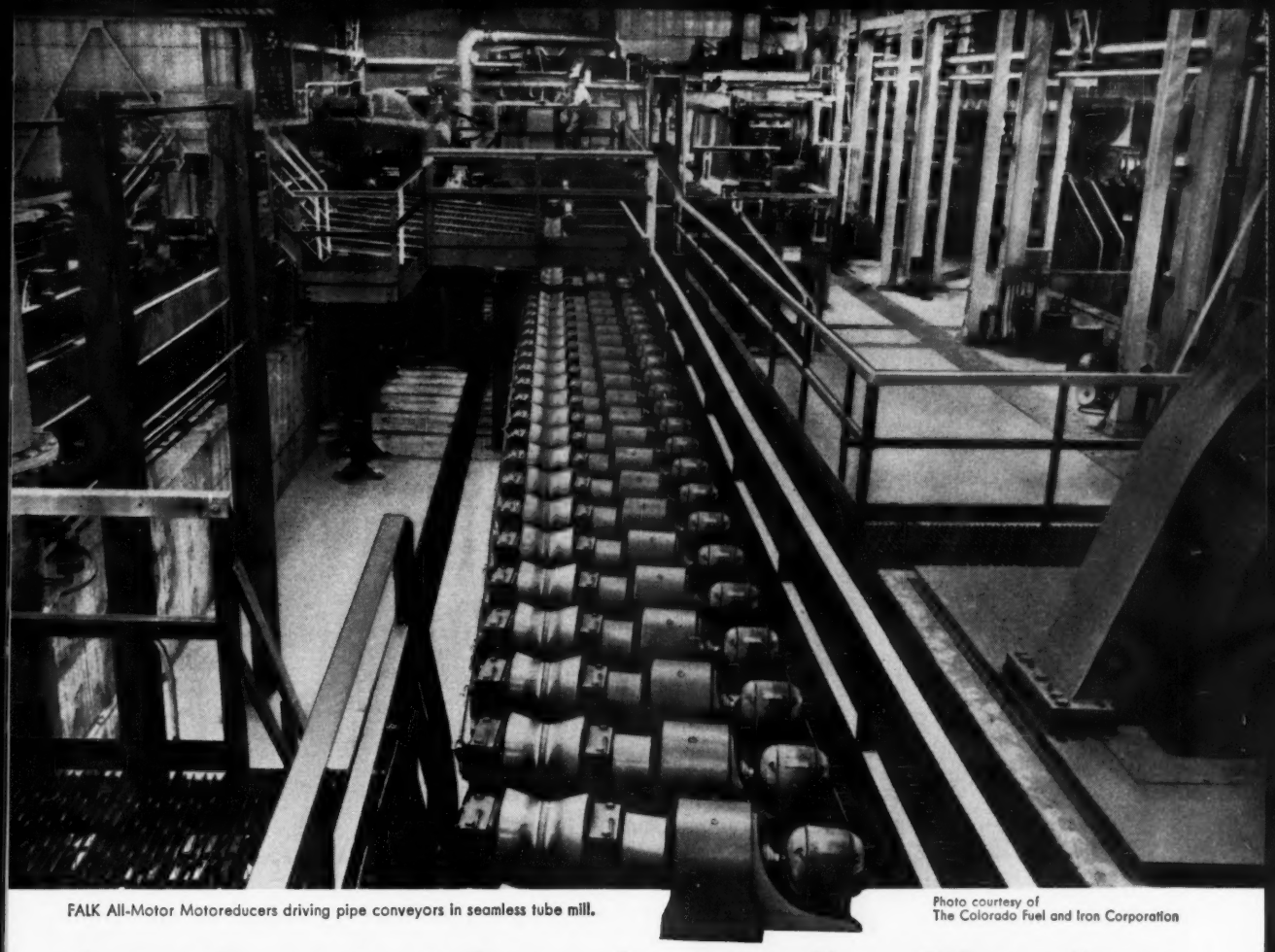
For specialized engineering assistance . . . or a helpful current Stock List . . . write or call the nearest distributor specializing in these Eastern alloys (addresses below).

EASTERN

STAINLESS STEEL

Baltimore 3, Maryland

PROMPT SERVICE FROM 3 STOCK SOURCES: Rolled Alloys, Inc., 5309 Concord, Detroit 11, Mich. • Rolled Alloys, Inc., 330 William St., South River, N.J. • Industrial Stainless Steels, Inc., 255 Bent St., Cambridge 41, Mass.



FALK All-Motor Motoreducers driving pipe conveyors in seamless tube mill.

Photo courtesy of
The Colorado Fuel and Iron Corporation

You get these "extras" when you buy FALK *all-steel* Motoreducers

1. **Freedom from damaged housings.** The exclusive FALK *all-steel* construction gives full protection from cracked housings or torn-off feet...plus twice the ability of cast iron to maintain vital alignment.
2. **12-15% reserve load-carrying capacity** in the gears, by AGMA standards. The extra-depth, high pressure angle helical gears are another FALK exclusive ...they assure better operation and longer gear life.
3. **Highest known gear efficiency**—98½% per gear train under full load! This means maximum productive work for your power dollar.
4. **Longer service life**...advanced FALK design makes it possible to machine both bores for each shaft assembly at one time, thus eliminating possible accumulation of tolerances that occurs when individually machined parts are assembled. The result—better alignment of revolving elements that permits units to transmit rated capacity longer.
5. **Standard units to fit your needs.** Integral and All-Motor® Motoreducers are available in horizontal, vertical and right angle types...a type for every use.

Units are available up to 75 hp; output speeds from 780 rpm down to 1.2 rpm. Prompt delivery from factory, warehouse or distributor stocks. Ask your FALK Representative or Authorized FALK Distributor for *Bulletin 3100.*

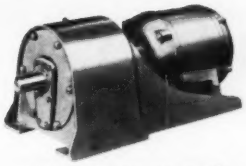
THE FALK CORPORATION, MILWAUKEE 1, WIS.

MANUFACTURERS OF QUALITY GEAR DRIVES AND FLEXIBLE SHAFT COUPLINGS

Representatives and Distributors in most principal cities

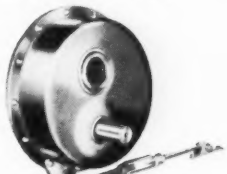
FALK

...a good name in industry



THE FALK ALL-MOTOR® MOTOREDUCER
the original All-Motor unit

(Shown) Horizontal concentric model. Also available in right angle and vertical types.



THE ALL-STEEL FALK® SHAFT MOUNTED DRIVE

Proved best for the countless industrial applications where a reducing unit mounting directly on shaft of the driven machine is indicated.

Units from 1/2 to 50 hp. Ratios —4:1, 14:1 or 24:1. Torque capacity up to 41,000 lb-in (in standard units). Prompt shipment from stock. For details, ask for ***Bulletin 7100.***

Roasting Supt. Charles Noonan, The Bunker Hill Co. Electrolytic Zinc Plant, Kellogg, Idaho. ESCO Spacer Casting exhibited by Noonan has been removed for inspection after 18 months of continuous service and is still in perfect operating condition.

"ESCO ROASTER ARMS LAST 2 TO 3 TIMES LONGER

and saved us $12,000 in original cost"

"Since we started using *ESCO* Roaster Arms, two and one-half years ago, we have gotten more than two full year's service from most of them and 90 per cent of them are still going strong," explains Roasting Superintendent Noonan, Bunker Hill Co.

"Operating conditions here are among the most severe to be found anywhere," Noonan continues, "but the high heat and heavy concentration of sulphur dioxide gas in the roasters just doesn't seem to hurt the *ESCO* parts nearly as much as the previous ones." And *ESCO* Roaster Arms can be successfully welded in the event of damage.

ESCO Roaster Arms are "job-tailored" to individual operating conditions for longer life and lower operating costs. For help with all your problems of corrosion, heat and abrasion, call or write an *ESCO* engineer today.

ESCO®

ELECTRIC STEEL FOUNDRY COMPANY

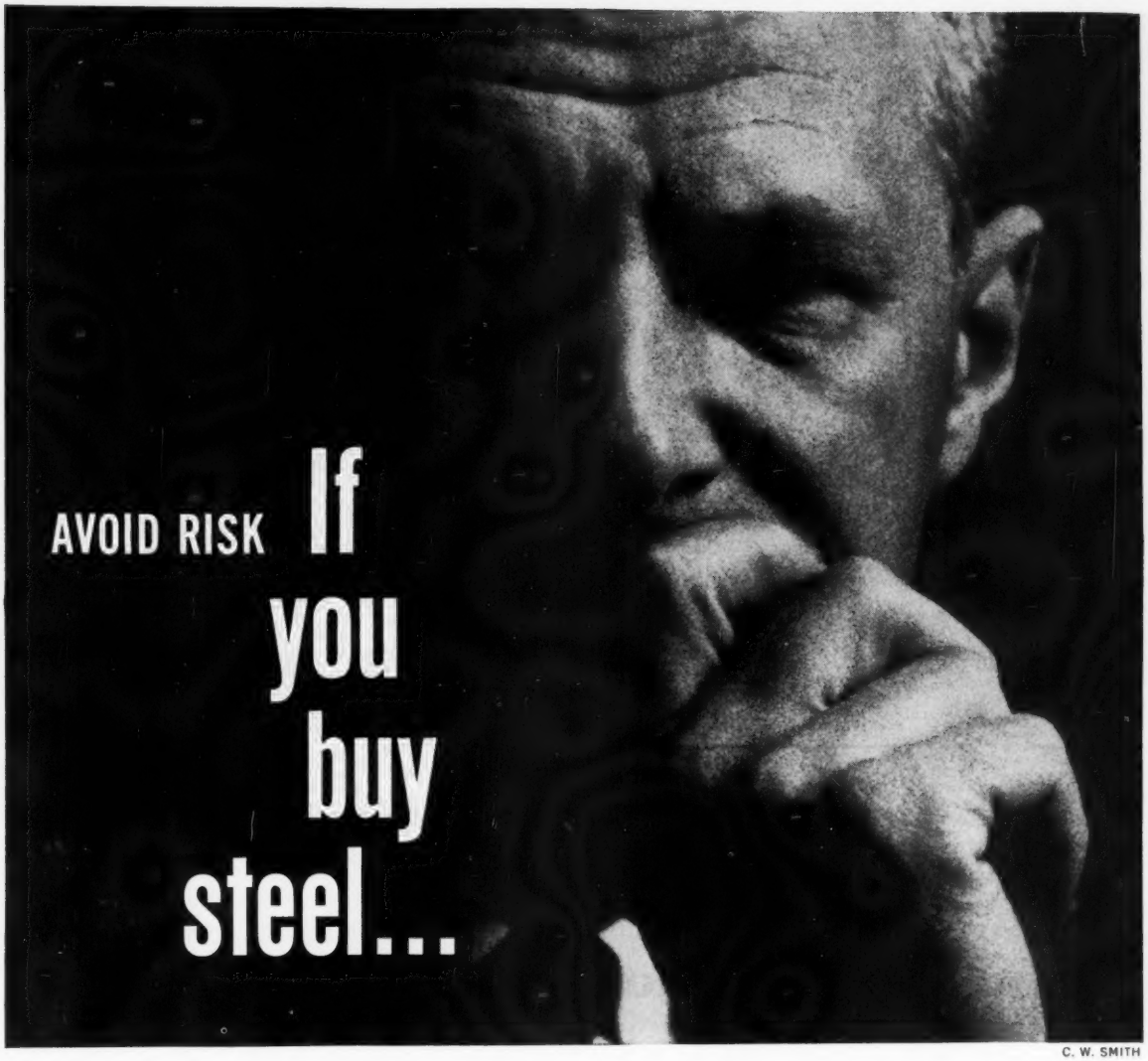
2160 N. W. 25TH AVE. • PORTLAND 10, OREGON

MFG. PLANTS AT PORTLAND, ORE. AND DANVILLE, ILL.

Offices in Most Principal Cities

ESCO INTERNATIONAL, NEW YORK, N. Y.

IN CANADA ESCO LIMITED



C. W. SMITH

USE OUR INVENTORY to continue your cost-control program

Worried about inventory? Want to put yourself in a position to assure continuity of production while holding down burdensome overhead? Then talk things over with your Steel Service Center.

It's only good business to avoid big-inventory risks. That way you make more productive use of capital and save on space, handling, obsolescence and wastage. Yet with your Steel Service Center you have adequate inventory to draw on at all times.

And it makes sense to continue your cost-control program. Why not continue free-of-risk steel buying from your Steel Service Center . . . get *all* the steel you need delivered *when* you need it, cut to exact size and ready for use.

Compare *all* your costs of inventoried steel with the cost of steel delivered as needed. Use the chart at the right. Or get the booklet, *What's Your Real Cost of Possession for Steel?* Ask your nearby Steel Service Center, or write to American Steel Warehouse Assn., 540 Terminal Tower, Cleveland 13, Ohio.

COST OF POSSESSION FOR STEEL IN YOUR INVENTORY

Per ton delivered	_____
Cost of capital:	
Inventory	_____
Space	_____
Equipment	_____
Cost of operation:	
Space	_____
Materials handling	_____
Cutting & burning	_____
Scrap & wastage	_____
Other costs:	
Obsolescence	_____
Insurance	_____
Taxes	_____
Accounting	_____
TOTAL	_____

COST OF FREEDOM-FROM-RISK STEEL FROM YOUR STEEL SERVICE CENTER

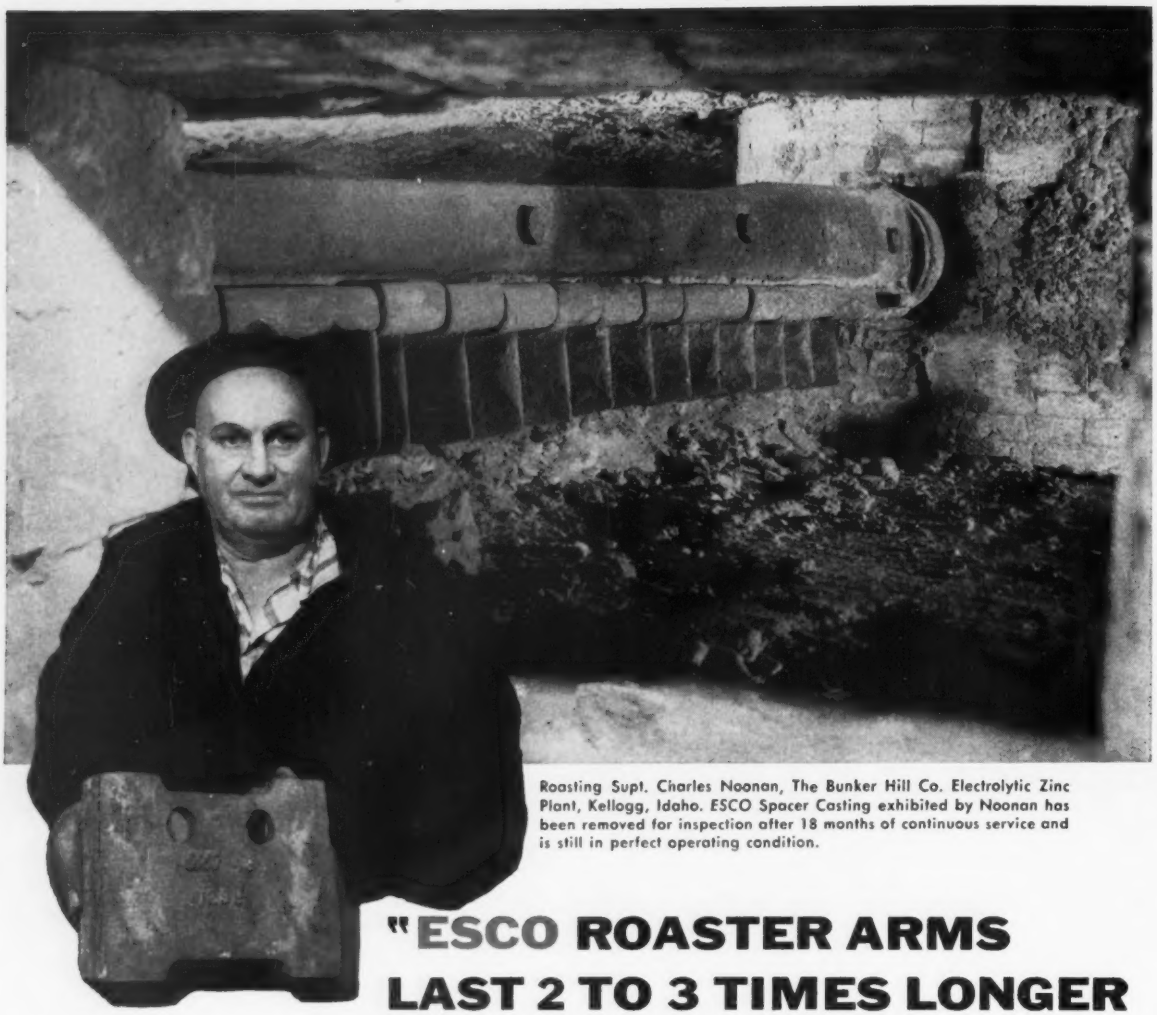
Per ton, cut-to-size, and delivered

TOTAL _____

AMERICAN STEEL WAREHOUSE ASS'N

The American Steel Warehouse

. . . YOUR STEEL SERVICE CENTER



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ESCO®

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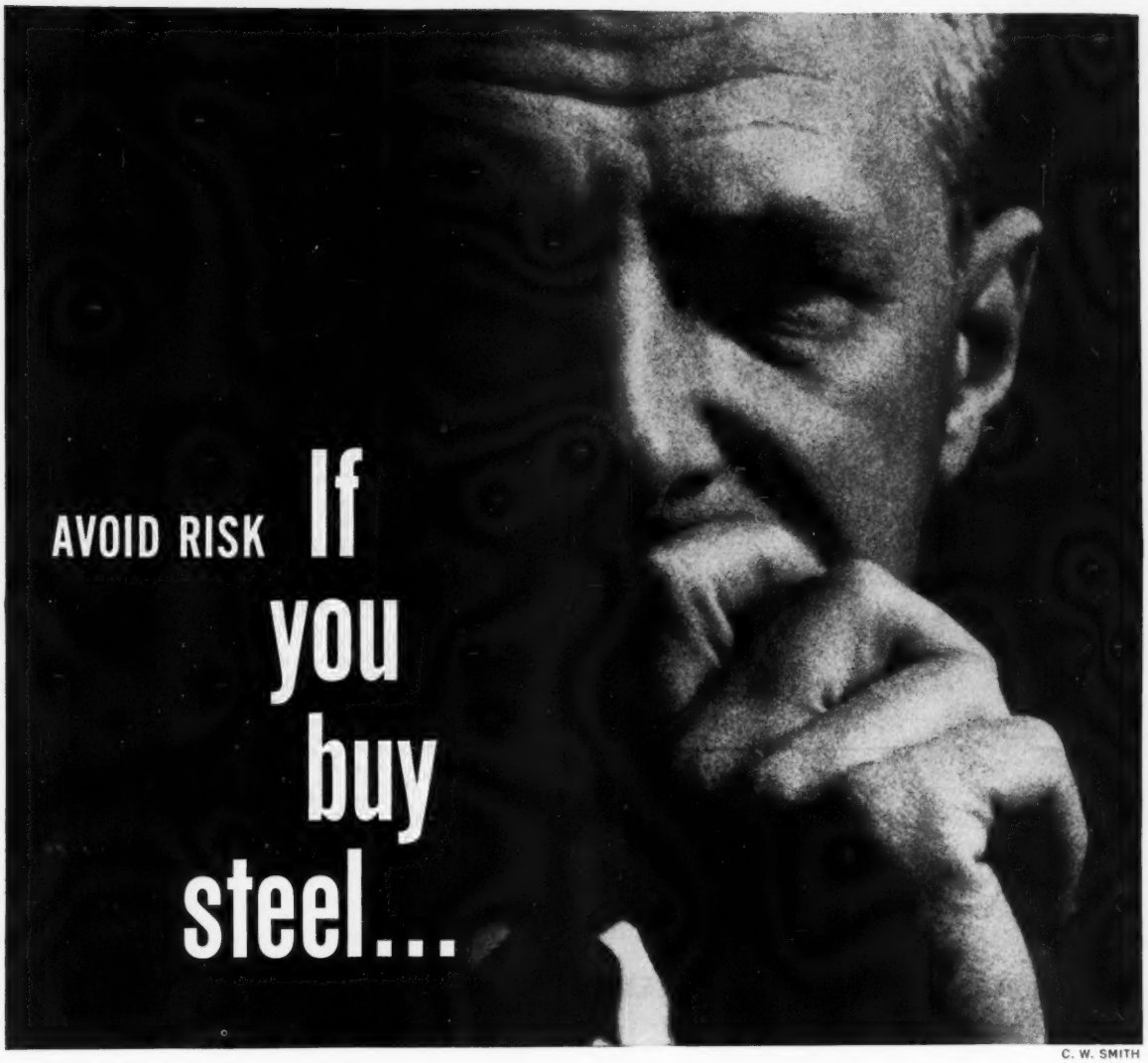

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Scrap & wastage	_____
Other costs:	
Obsolescence	_____
Insurance	_____
Taxes	_____
Accounting	_____
TOTAL	_____

COST OF FREEDOM-FROM-RISK STEEL FROM YOUR STEEL SERVICE CENTER

Per ton, cut-to-size, and delivered

TOTAL _____

AMERICAN STEEL WAREHOUSE ASS'N

The American Steel Warehouse

. . . YOUR STEEL SERVICE CENTER

TO EACH HIS OWN-climate, that is-

WITH "BUFFALO" ZONE CONTROL CABINETS

He's comfortable because the heat's on in his office. She's comfortable, too — but her office area is air cooled. The executive offices are on the shaded north side of the building and a cold wind is blowing. The stenographic department is located in the windowless central portion of the floor, where internal heat load raises the temperature.

Time was when conditions like these could only be corrected the expensive way — by installing several separate air conditioning units for each of many zones.

Now, with a *single* "Buffalo" Zone Control Cabinet, you can provide low-cost heating, cooling, dehumidifying — in any desired combination — for each area in your offices or plant. Controls for each zone can be manual or automatic.

We all know that a comfortable working climate increases personnel efficiency. Your offices or plant can have individual zone climate control — *without the expense of several separate units.* It will pay you to investigate "Buffalo" Zone Control Cabinets. Call your "Buffalo" engineering representative, or write for Bulletin AC-220.

"Buffalo"

BUFFALO FORGE COMPANY

Buffalo, N. Y.

Buffalo Pumps Division, Buffalo, N. Y.

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

VENTILATING • AIR CLEANING • AIR TEMPERING • INDUCED DRAFT • EXHAUSTING • FORCED DRAFT • COOLING • HEATING • PRESSURE BLOWING

For extra high strength wire rope...
use CF&I-Wickwire *Double Gray*

The CF&I Image reflects CF&I's experience as a producer of many steel products and CF&I's versatility in developing new products to meet exacting requirements . . . like Wickwire Double Gray*.

The special steel used in Double Gray provides extra resistance to the deforming effects of peening and crushing which occur on the drums and sheaves of heavy equipment. Double Gray also gives extra resistance to abrasion.

Because of these superior qualities, Double Gray rope quickly repays its slightly higher initial cost in safer, more economical operations. Use it wherever extra high strength wire rope is required.

For a free copy of our Double Gray booklet, write to: Advertising Department, The Colorado Fuel and Iron Corporation, 575 Madison Avenue, New York 22, N. Y.

**Wickwire Double Gray Wire Rope is made of extra-improved plow steel. Fortified by an independent wire rope core of the same extra high strength steel, Double Gray rope has a 15% higher breaking strength than the catalog breaking strength of an improved plow steel rope with IWRC.*

6632

WICKWIRE ROPE

THE COLORADO FUEL AND IRON CORPORATION

In the West: **THE COLORADO FUEL AND IRON CORPORATION**—Albuquerque · Amarillo · Billings · Boise · Butte Denver · El Paso · Farmington (N.M.) · Fort Worth · Houston · Kansas City · Lincoln · Los Angeles · Oakland · Odessa (Tex.) Oklahoma City · Phoenix · Portland · Pueblo · Salt Lake City · San Francisco · San Leandro · Seattle · Spokane · Tulsa · Wichita

In the East: **WICKWIRE SPENCER STEEL DIVISION**—Boston · Buffalo · Chattanooga · Chicago · Detroit · Emlenton (Pa.) New Orleans · New York · Philadelphia

CF&I STEEL

Lincoln

WELDYNAMICS

NEWS ABOUT ARC WELDING AT WORK CUTTING COSTS

Press frame is typical of fabrication done at Paterson-Leitch.

WELDING COST SURVEY SHOWS WAY TO BIG SAVINGS AT PATERSON-LEITCH

A cost reduction survey at The Paterson-Leitch Company of Cleveland, one of northern Ohio's largest steel warehouses and fabricators, indicated possible savings of almost $22,000 a year.

The survey made on two typical types of welds indicated that phenomenal savings could be realized by several simple procedural changes to eliminate over-welding, and by switching from DC to AC machines to achieve the best performance from the Jetweld iron-powder electrode being used.

P. L. Holden, a Lincoln welding engineer, spotted the difficulty on one of his regular visits to the plant—offered to make the survey and received the approval of Mr. L. M. Hardnack, Plant Superintendent.

Mr. Hardnack stated, "Because our work is so varied, it's hard to pin down costs on every operation. However, we have tried to follow Mr. Holden's recommendations, and I would be safe to say that we have realized at least 60% of the predicted benefits."

Lou Hardnack, Plant Superintendent, "We appreciate the professional engineering services of the Lincoln man."

For help with procedures and cost reduction ideas call your Lincoln welding engineer today.

NEW IDEALARC WELDER TAILORED TO YOUR NEEDS

The new Lincoln Idealarc "TM" welder has been designed to meet the needs of any shop.

The key to the "TM" model's versatility is a wide range of options that expand the applications for the machine.

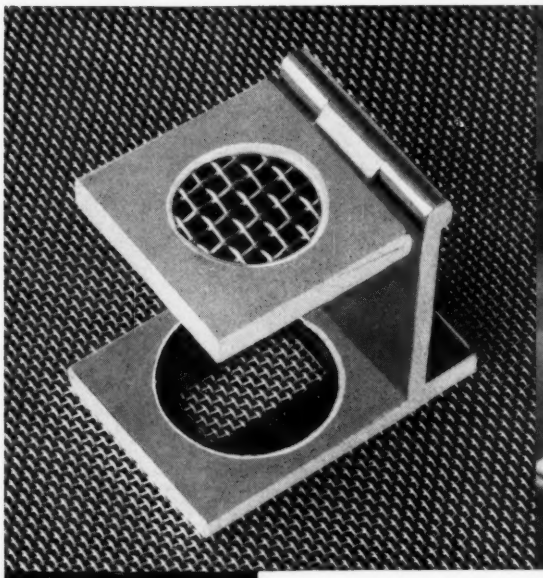
Basically the Idealarc "TM" is a transformer type AC or AC/DC machine, depending upon the choice of the owner, with a moveable core reactor current control. Many new features have been built into the machine to improve welding characteristics, increase efficiency and to protect the machine.

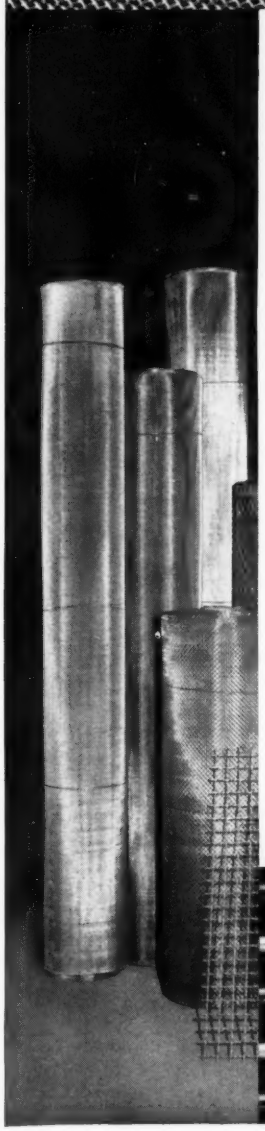
Special features such as remote current control, remote selector switch control, ML-2 power pack, 115 volt push-button control, and others, are optional to adapt the machine to any welding requirement. Some of the options are available in kit form and can be installed in the field.

These new Idealarcs are available in 300, 400, 500 and 650 amp sizes.

Bulletin 4607.1 has all the details and specifications. A copy may be obtained by writing The Lincoln Electric Company.

THE LINCOLN ELECTRIC CO.
Dept. 1652 • Cleveland 17, Ohio
The World's Largest Manufacturer of Arc Welding Equipment





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. . . because *exact* mesh count and mesh size are the trademarks of Cambridge INDUSTRIAL WIRE CLOTH.

But, quality isn't the whole story. When you call Cambridge for industrial wire cloth, you also get service . . . prompt answers to your inquiries . . . quicker deliveries . . . and an experienced Field Representative who follows up your order to make sure our product is giving you the best possible service. Let us quote on your wire cloth needs. We manufacture wire cloth from any metal or alloy—including titanium—in nine basic weaves. Very likely, we have what you require in our warehouse right now. For samples or more information, call your Cambridge Field Engineer...he's listed in the yellow pages under "Wire Cloth". Or, write for FREE 94-PAGE CATALOG.

The Cambridge Wire Cloth Co.

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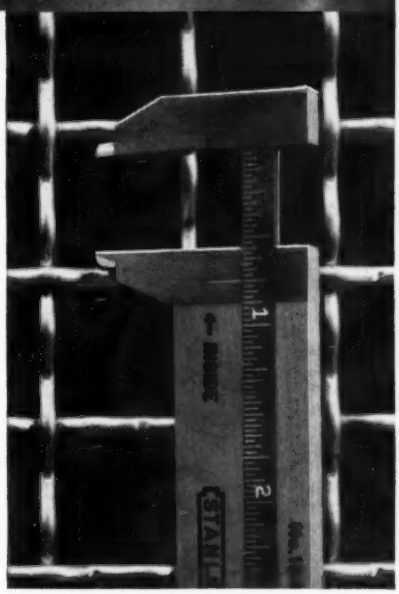
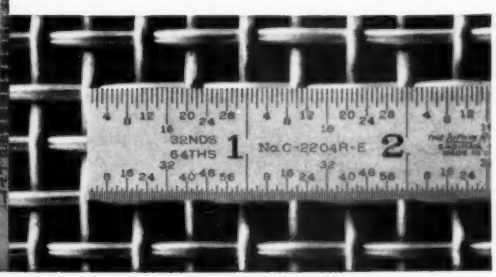
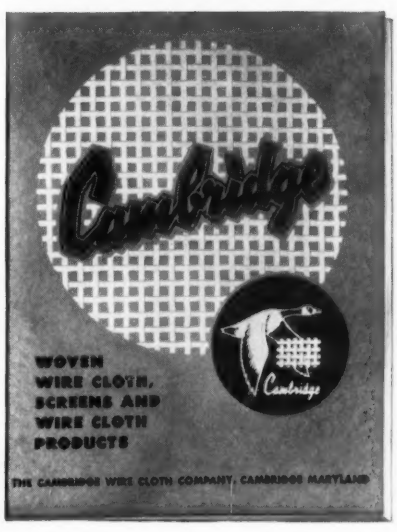
Manufacturers of Wire Cloth, Metal-Mesh Conveyor Belts, Wire Cloth Fabrications

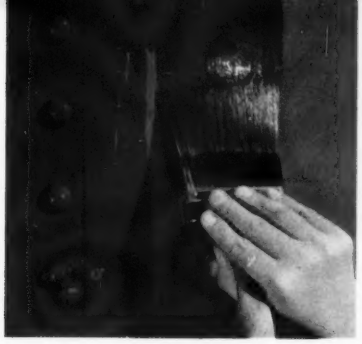




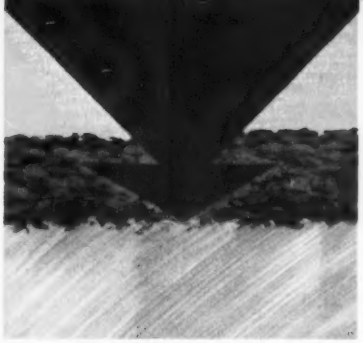


You the
RUST-OLEUM®
RUST PREVENTIVE
STOPS RUST!®
BEAUTIFIES AS IT

take brush!

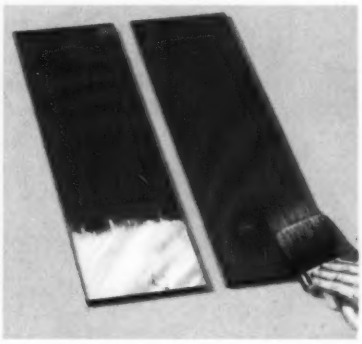


Apply Rust-Oleum 769 Damp-Proof Red Primer directly over sound rusted surfaces. Saves costly surface preparations—lasts and lasts.



The **specially-processed** fish oil vehicle in the primer penetrates rust to bare metal—as proved in radioactive tracing studies.

Rust-Oleum, in its many forms, resists rain, fumes, heat, moisture, sun, and general weathering to stand up over the years.



Up to 30% more coverage with Rust-Oleum, depending upon the condition and porosity of the surface. Another Rust-Oleum difference.

See the many Rust-Oleum DIFFERENCES yourself!

Rust-Oleum primers and finish coatings are easily applied by spray. Flows smoothly . . . may be used in conventional, hot spray, or high pressure air-less spray.

A few easy strokes of the brush proves more than a thousand words . . . see how smoothly Rust-Oleum flows on . . . no pull, no drag . . . and it dries free of brushmarks. See, too, how much more coverage Rust-Oleum gives you . . . up to 30% more area depending upon the condition and porosity of the surface.

If your metal surfaces are *rusty* – simply brush or spray Rust-Oleum 769 Damp-Proof Red Primer right over the sound rusted metal after scraping and wirebrushing to remove rust scale and loose rust. The *specially-processed fish oil vehicle* in the primer penetrates rust to bare metal—driving out air and moisture. Easy as that to Stop Rust—and save time, money, and metal.

For *lasting beauty* – follow up with a Rust-Oleum finish coating in the color of your choice – from grays, greens, blacks, and aluminums to yellows, blues, whites, or browns – or from the many popular pastel shades.

That is the Rust-Oleum *System* of primer and finish coat for maximum over-the-years protection. A system that is measured by the money you save. Specify Rust-Oleum for maintenance, new construction, and re-modeling. Your Rust-Oleum Industrial Distributor maintains complete stocks for prompt delivery . . . he will be happy to consult with you on your coating problems.

What is your coating problem? What **color** do you need? Get lasting beauty in the color of your choice. Mail coupon for color charts.

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Distinctive as your own fingerprint.

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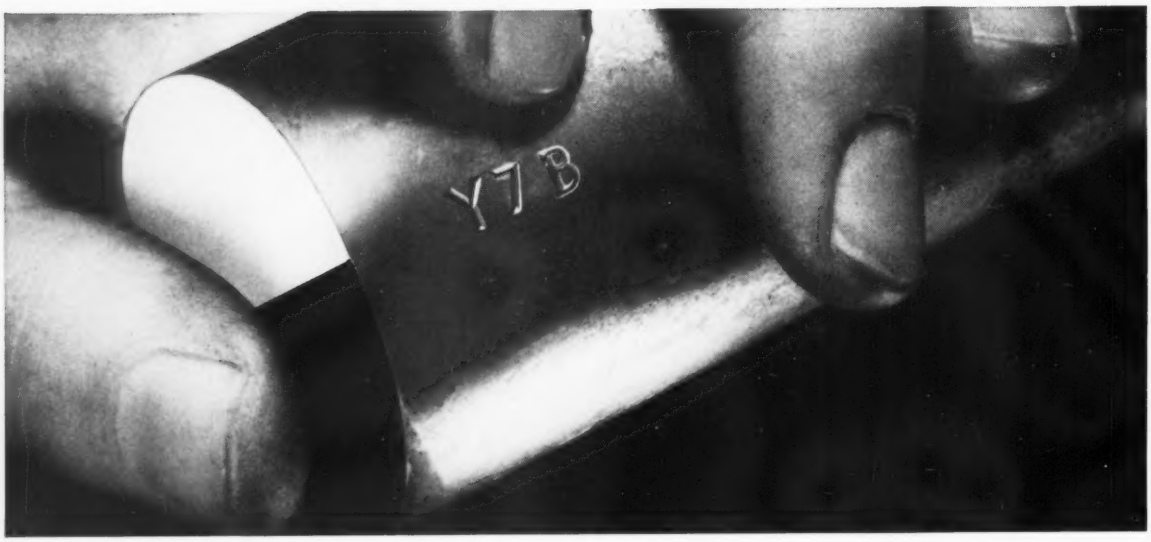
2981 Oakton Street, Evanston, Illinois

Please send me the following at no cost or obligation:

- ☐ Free test sample of Rust-Oleum 769 Damp-Proof Red Primer for rusted metal surfaces.
- ☐ Complete literature with applications and color charts.
- ☐ Information on matching special colors.
- ☐ Thirty-page report on Rust-Oleum fish oil penetration.

As positive as a fingerprint—

certified alloys from Ryerson



Alloys from different furnace heats can vary in hardenability and other working characteristics. But with Ryerson alloys you *know* the differences—before you start production. Ryerson alloys are marked with symbols identifying them with the particular heat from which they were rolled. As a Ryerson *extra* you get a dependable special report showing:

1. **Heat analysis.** Not just the chemical range for the type of alloy, but the specific analysis of the heat from which your steel was rolled.
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For more information about Ryerson alloys and the Ryerson Certified Alloy Steel plan, call your nearby Ryerson plant.

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Ask about this Ryerson Plan for 1959

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Metalworking Outlook

May 18, 1959

USW Demands More Leisure

David McDonald has placed a spread-the-work proposal high on the USW list of demands. He reportedly wants a four day, 32 hour week every fourth week. It would give employees 13 extra paid holidays per year. Reason for the demand: An estimated 50,000 steelworkers are idle while steel production is setting records. The industry continues to be against anything that would tend to let in more foreign steel, give competitive materials an edge, or push up prices. The conflict makes a walkout a good bet (Page 57).

Unfair Labor Practice Cases Hit All-Time High

A record 3426 unfair labor practice cases were filed with the National Labor Relations Board during the first quarter. The general counsel issued a record 274 complaints. Unions filed 30 per cent of the unfair practice cases; employers 8 per cent; individuals 62 per cent. In 1227 collective bargaining elections, 59 per cent of the valid votes were cast for union representation. Unions won majority designation in 62 per cent. AFL-CIO unions won 500 of 888 elections.

How Secretary Mitchell Views Current Labor Problems

The federal government will keep outside the collective bargaining process . . . Labor and management are aware of the public interest involved in major contract settlements . . . Top executives should talk ideas and viewpoints in contract negotiations . . . A national productivity index has little value in bargaining . . . Worker ownership plans help to combat Communist propaganda . . . We need much more planning to handle the effects automation will have in a few years. Those points are made by James P. Mitchell, U. S. secretary of labor, in an exclusive STEEL interview (Page 58).

Employment: Trend Is Up

Metalworking boosted its labor force 1.2 per cent in March, indicates the Labor Department. The primary metal industries led the pack with a 2.5 per cent increase. For all manufacturing, hirings in March exceeded separations by 0.9 per cent.

Here's First Quarter Strike Toll

U. S. industry suffered twice as much idleness due to strikes during the first quarter as it did in the year-earlier period. About 675 stoppages, in-

volving 240,000 workers, began during the period—20 per cent more than a year ago, but less than any other postwar year. Total strike-caused idleness: 4.5 million mandays. About 250 strikes started in March, estimates the Labor Department.

During Second Month of a Steel Strike, Imports Would Hit . . .

Don't expect steelmakers to grant major contract concessions to avoid a strike—despite the huge inroads foreign steel might make during a walkout. Reason: Steelmen believe a more equitable contract is the key to eventually becoming competitive with foreign producers (Page 55). And much of the foreign steel bought as a strike hedge has been shipped.

400,000 tons

Here's an Industry with an Export Boom

U. S. makers of electric, overhead traveling cranes are pushing deeper into world markets, a Commerce Department survey shows. The industry exported $7.4 million worth of its products last year—a 66 per cent increase over 1957 shipments. Biggest customers: Brazil, Mexico, Chile, and Cuba.

Practical Politics: Solution to Better Business Climates

Management has lost its political effectiveness in its home community, charges Thomas R. Reid, Ford Motor Co.'s director of civic affairs. Result: Our business climate is threatened. It means that practical politics is an important new dimension in your role as a metalworking manager. You want depreciation reform, lower corporate taxes, lower personal income taxes, zoning laws that encourage expansion, local and state governments that encourage industrial growth. You can help yourself achieve some of those goals with a plan of action (Page 99).

CF&I Plans Switch to Oxygen

Colorado Fuel & Iron Corp. is thinking about installing oxygen converters at its Pueblo, Colo., plant, to speed production and bolster capacity. Estimated to cost $10 million to $12 million, the financing may be a bank loan, stock issue, or bond issue. Oxygen converters turn out a batch of steel in about an hour vs. 7 to 9 hours with the open hearths CF&I now has at Pueblo.

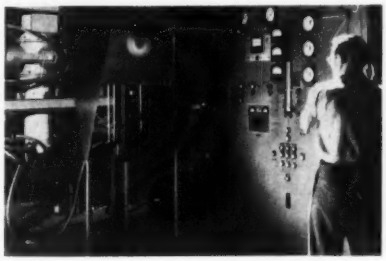
Top Executives Are Scarce

"Never before has there been so keen and anxious a search for men to become company presidents or to join the uppermost echelon of vice presidents . . . and never before have so few men been prepared to fill those posi-

tions," asserts G. Lawton Johnson of Boyden Associates, New York management consulting firm. Keen competition, swift technological change, and generally more complex industrial management have raised the standards for executives and have led companies to look for "professional managers" with judgment developed in a rise through the ranks, he reports. He says you'll be more apt to make the grade if you're alert in conversation, orderly in your thinking, forceful and clear in your speech, and can think on your feet. Volunteering a reasonable sacrifice in your personal life in the interest of your company's welfare also may give you the nod. And having a wife who encourages you in your work and shares your enthusiasm and interest is mighty important, too, he reports.

Rosy Future for Vacuum Melted Steels

Expect buyers of tool steels to demand a wider variety of vacuum arcmelted grades within three years. Many important steel producers go along with such thinking, judging by the activity in the field (Page 64). Premiums may eventually be lowered to attract bigger volumes.



Are Your Machines Outmoded?

Chances are you'll have to answer "yes." If all the machine tools built in the last five years had been applied to replacement needs (none for expansion), we would only have been replacing machines at a rate of once in 33 years. Few machine tools have a profitable productive life half that long. And at the 1958 shipment rate, we would replace machines only once in 62 years. Obviously, the U. S. is not keeping its machine tool equipment up to date. One big reason is inadequate depreciation allowances, points out Frederick V. Geier, chairman, Cincinnati Milling Machine Co.

Reactor Metal Boosts Steel Output

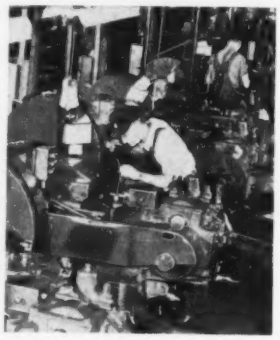
Look for wider use of wash metal in steelmaking furnace charges. Removal of silicon and sulfur from hot metal may boost output as much as 15 per cent for open hearths, 50 per cent for electrics. A new process, developed by Diamond Alkali Co., treats molten iron with an alkaline material, iron ore, and oxygen in a rotary reactor. In pilot operation more than a year, it reduced sulfur to 0.03 per cent and silicon to 0.40 (Page 118).

Small Firms Will Lease More Equipment

Expect smaller companies to turn more heavily to leasing of equipment. Originally a big business technique to save liquid cash, leasing is winning popularity polls among small firms today. About $227 million worth of equipment was on lease at the end of 1958—40 per cent of it to firms with

assets of less than $500,000. That percentage will probably rise because leasing helps to spur growth, aids modernization, permits 100 per cent financing, and offers tax advantages. Drawback: The gross dollar outlay for leased equipment is usually greater than for purchased equipment.

Fasteners: Make 'em or Buy 'em?



Volume production facilities like the battery of headers (pictured) at Townsend Co., New Brighton, Pa., often give the fastener maker a cost edge, making it cheaper for you to buy fasteners than to make them. Don't be misled into thinking that small parts are a natural way to use your idle capacity—they may turn out to be a luxury. For a clearer view of the fastener production and profit picture, cost out your proposed operation against the checklist on Page 110.

Republic Plans $375 Million Expansion

Republic Steel Corp. will spend around $375 million on capital improvements over the next four years. No new plants are involved. The program may include the addition of 300,000 to 400,000 tons of annual capacity to bring one mill into better balance between producing and finishing facilities. The spending timetable: $55 million this year, $110 million next year, $84 million in 1961, $60 million in 1962, the balance in 1963. The program, largest in Republic's history, will require no outside financing except temporary borrowings.

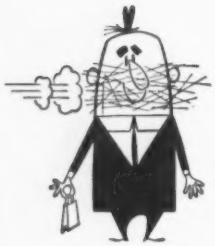
Washington Notes

The House Ways & Means Committee tentatively voted a four year extension of the Renegotiation Act. (It permits Uncle Sam to recapture "excess" profits on defense contracts.) . . . Don't expect Congressional approval of a Post Office proposal to raise the regular letter rate to 5 cents . . . Steelworker productivity fell 2.9 per cent (not the 6.2 per cent first reported) from 1956 to 1958, estimates the Labor Department.

How Congress Will Vote on Antitrust Laws

Odds favor passage of a bill to require premerger notification by large corporations and another to give the Justice Department access to corporate records. But expect the House to kill a measure that would limit the "good faith" defense for price reductions.

Straws in the Wind



Look for more co-operation between the trucking industry and railroads. It will mean better, faster, and maybe cheaper, service to you . . . The farm equipment industry's profit-to-sales ratio climbed to 4.3 last year from 2.9 in 1957 . . . A *Chicago Daily News* survey of steelworkers agrees with an earlier survey by Columnist Sam Lubell: Chicago area workers don't want a strike and aren't excited about a wage increase; most of them would settle for improved pensions and insurance . . .Republic Steel Corp.'s C. M. White says the steel industry may return to second quarter operating levels in the fourth quarter—after a third period dip.

This is a MARVEL High-Speed-Edge Hack Saw Blade Cutting a 4" x 4" Titanium Billet

EVERYTHING'S IMPROVED BUT THE GUARANTEE

33 years ago, MARVEL introduced the first welded-edge hack saw blades . . . guaranteed them to be shatterproof . . . and a new concept of power hack sawing came into existence.

In combining, by welding, two materials—a narrow, high speed steel cutting edge, and a tough alloy steel body, MARVEL pioneered the modern hack saw blade.

When operators learned they could apply the heaviest feed pressures and highest speeds to the new MARVEL Blades with complete confidence that they would never shatter or "explode" to cause them personal injury, hack sawing began the approach to its present high level of efficiency. Even cutting "exotic" metals, such as titanium, where heavier feed pressures are a necessity, the MARVEL Blade does an outstanding job and is completely safe.

Today's MARVEL High-Speed-Edge Hack Saw Blades are greatly improved, even over the MARVEL Blades which were the best on the market a few years ago. Advanced metallurgy has produced better steels; new heat treating and manufacturing techniques have brought further improvements. The only thing unchanged is the Guarantee: THEY ARE SHATTERPROOF!

If you haven't used MARVEL High-Speed-Edge Hack Saw Blades recently, try them on your saws for a month and see the difference a truly superior blade can mean in higher speeds, greater accuracy, lower cost per cut, and guaranteed safety to operating personnel. Your nearby MARVEL Distributor carries a complete stock of MARVEL High-Speed-Edge Blades.

Write for Bulletin CT-175 which has complete details on MARVEL High-Speed-Edge Hack Saw Blades.

ARMSTRONG-BLUM MFG. CO.
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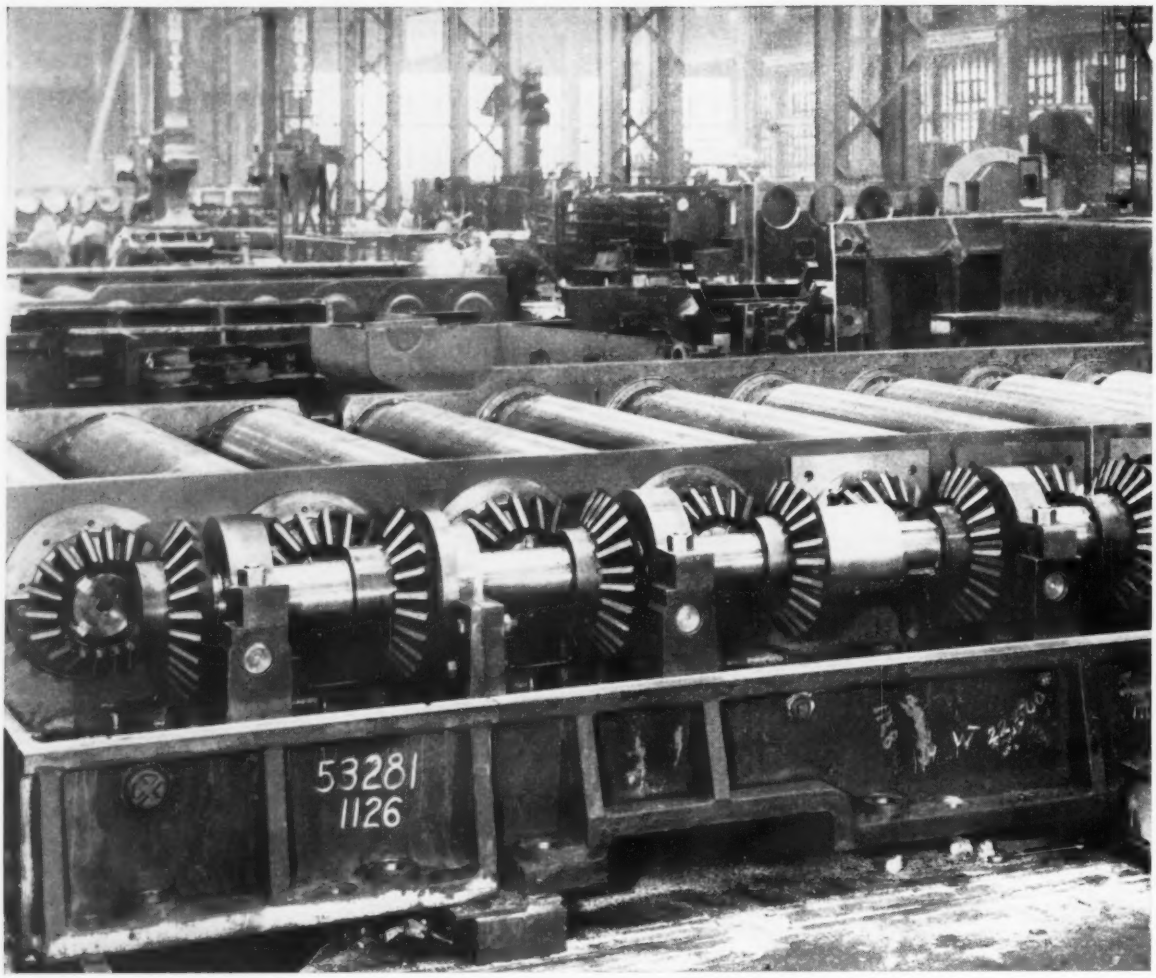
MARVEL *Metal Cutting* **SAWS**
Better Machines–Better Blades



The AISI 4340 steel in these gears gives you strength, toughness, and reliability. It's readily annealed, yet it can be machined at fairly high hardness levels. It welds easily with appropriate procedures and responds reliably to heat treatment.

Gears of 4340 Nickel alloy steel keep slabbing mills rolling . . . dependably

How well do heavy-duty gears of 4340 Nickel alloy steel perform?

United Engineering and Foundry Company reports, "4340 Nickel-alloyed steel mill gears are still on the job after three years' service."

You can expect maximum performance from 4340 through-hardening steel because of its excellent combination of strength and toughness when properly heat treated. Its high hardenability insures uniform properties in parts like gears which have different section sizes.

4340 through-hardening Nickel alloy steel may be the answer to your own parts problem where moderate-to-heavy sections are involved. You'll find this steel easy to process and readily available from Steel Service Centers throughout the country.

Technical information on 4340 and other Nickel-alloyed steels is readily available, too. Just ask us for the facts you want.

The INTERNATIONAL NICKEL COMPANY, Inc.
67 Wall Street INCO New York 5, N. Y.

INCO NICKEL

NICKEL MAKES ALLOYS PERFORM BETTER LONGER

What Makes People Tick?

For a long time, you, as a management man in metalworking, have been considered a sort of Dr. Jekyll and Mr. Hyde.

At home, you supposedly are the typical family man who generally reacts emotionally.

At work, you supposedly become another individual, one who deals with business problems unemotionally and rationally.

It's not so! You are the same person at work and at home. You make all your decisions on emotional as well as rational bases.

While this is something you probably have suspected all along, it is confirmed by a motivational research study (STEEL, Apr. 6) made for STEEL's editors by Dr. F. Robert Shoaf of New York University. Here are some of his conclusions about different levels of management:

Company presidents are reflective men with a practical philosophy based upon personal experiences or those of predecessors. They are not too tolerant of the opinions of others in a controversy. They may well be "lonely."

Vice presidents and general managers have attitudes and business values similar to those of presidents, but their personalities are less rigid.

Men in engineering management are objective, moderate in their opinions, and personable. They are less concerned with such things as price and production costs; so their emphasis on maintaining tolerances and rigid specifications is sometimes unrealistic and impractical.

Men in production management are interested in cost cutting and increased production—but more within their own departments. They also figure they can go clear to the top.

Members of purchasing management don't expect to be presidents, but they would like personal recognition as vice presidents. Because of the nature of their job, they have to be tough.

Perhaps none of those descriptions fits you precisely. If not, it is further evidence that people are alike, yet wholly unalike.

The trick in getting along in your job and in life is to develop a better understanding of how people tick—and how you tick yourself!

Irwin H. Such
EDITOR-IN-CHIEF

Unless you buy leaded steels directly from Inland's Indiana Harbor Works, chances are you've never seen this tag. But among Cold Drawers and Steel Warehouse men who process and sell leaded steels in a variety of forms to manufacturers, it is famous.

Every one of them recognize that behind this tag lies years of research, development and *unequaled experience.* Twenty years ago it marked the world's first commercial leaded steel. Today this tag represents the standard of performance by which all other free-machining steels are compared. It signifies LEDLOY* . . . the most machinable leaded steels obtainable.

INLAND STEEL CO., 30 West Monroe Street, Chicago 3, Illinois.

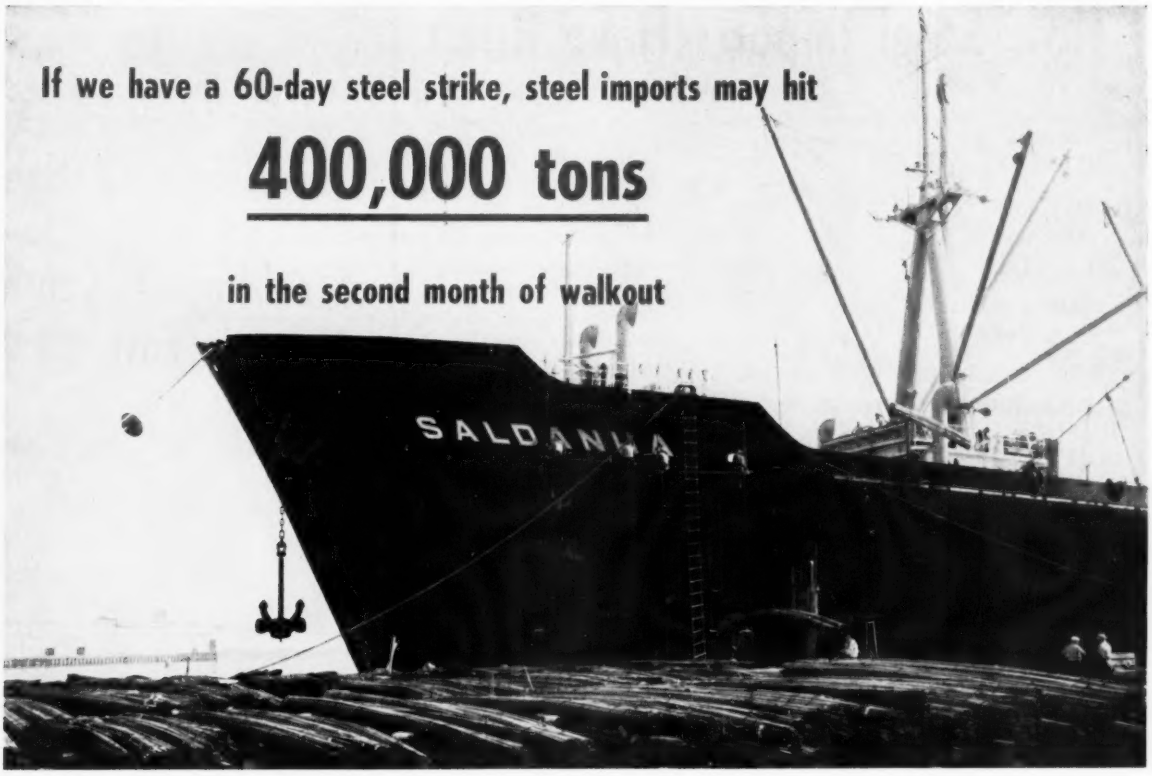
Get Inland Ledloy *steels in cold drawn form, sometimes sold under different trade names, from leading cold drawers and Steel Service Centers from coast to coast.*

*Reg. Trade Mark

This is INLAND LEDLOY®

WORLD'S MOST MACHINABLE STEEL

INLAND STEEL COMPANY



IMPORTS will make damaging inroads into domestic markets for steel if steelworkers strike for two months, believes an export department official for a major U. S. steel company.

Here's his analysis:

During the second month of a strike, imports would climb to a record 400,000 tons. (It looks like a record monthly average, 240,000 tons, will be set in this year's first half.)

During the first 30 days of a strike, imports would hold at about 240,000 tons because users couldn't give their foreign suppliers enough notice.

• The fact that a long walkout could "educate" American users about steel from abroad has U. S. producers worried.

"This is like opening Pandora's box," comments one. "The 400,000 tons expected in a strike's second month could lead to much bigger imports in the years ahead."

Are steelmakers worried enough about the situation to make major contract concessions on economic issues to keep operating?

No. They think a more equitable contract is the key to eventually becoming competitive with foreign producers. Hourly steel wages in the U. S. are three to eight times those of the major competitors abroad. Paradoxically, American steel may have to take a strike this summer to get more competitive.

• Steel is not readily available from some foreign countries, but all nations will strain to make a little more of the metal for sale to the U. S. just to get the import door open wider.

West Germany is probably in the best position. She's operating at 79 per cent of capacity (in March, but early data show April higher). Other operating figures (all for March): France—100 per cent; Netherlands—109, Belgium—87, Luxembourg—99, Italy—88, Saar—95. First quarter tonnage figures for ingot output: West Germany—6.9 million in the 1958 period, 5.9 million in 1959; Britain—6.1 million in 1958, 5.2 million in 1959.

• Import inroads into west coast markets, especially by Japan, have been particularly severe.

In 1959's first quarter, west coast imports of steel are estimated to have reached 192,243 net tons, a 99 per cent gain over the first three months of 1958 when the figure was 51,438 tons. Plate imports jumped 1400 per cent between the two quarters, reinforcing bars 216 per cent, tubular products 158 per cent, wire rope 149 per cent, hot-rolled bars 146 per cent. It means that foreign steel mill products have about a 6 per cent slice of the western market. The current national figure is 3.8 per cent.

In 1958, steel imports into west coast ports reached a postwar high of 333,100 tons, or 53 per cent above the 1957 mark. What makes it particularly tough on west coast

How Steel Imports Have Risen

	Imports 1947-49 Average (Net tons)	% of Imports to Domestic Shipments	Imports 1958 (Net tons)	% of Imports to Domestic Shipments
WIRE RODS	6,120	1.1	181,283	20.6
PLAIN WIRE	809	0	133,687	5.7
FENCING	3	0	36,671	23.7
NAILS & STAPLES	1,500	0	201,229	48.6
BARBED WIRE	33	0	59,253	108.0
STEEL PIPE & TUBING	4,922	0.1	200,038	3.4
HOT & COLD ROLLED SHEETS & STRIP	4,782	0.03	25,181	0.12
ALL STEEL PRODUCTS	163,066	0.3	1,702,819	3.0

Source: Pittsburgh Steel Co. and American Iron & Steel Institute.

producers is that the 1958 figures represented more than 18 per cent of all steel shipped into the U. S., while the west coast market accounts for about 10 per cent of the national market.

But Japan will have more trouble than other foreign producers in boosting shipments to us if we have a steel strike. She is trying to catch up with domestic demand that was unsatisfied during walkouts which closed her two biggest mills from Feb. 25 to Apr. 16. They lost some 500,000 net tons of production, and it will be at least June before they make up the deficiency.

• Foreign producers' prices would probably rise during a steel strike, but their quotations will still be under domestic levels.

Japan has already boosted her prices 3 to 8 per cent all along the line. Even so, they're substantially under ours. Here's proof (in San Francisco, per 100 lb): Rebars are 73 cents lower than the domestic price, or 11.3 per cent under; wire rods are $2.55 lower, or 31.7 per cent under; buttweld pipe (2 in. standard black) is $1.98 less, 20 per cent under; 20 penny common nails cost $3.36 less, a 22.3 per cent advantage.

European producers' prices tell the same story. Barbed wire made by U. S. Steel Corp. in Cleveland and shipped less than 200 miles to Dayton, Ohio, costs about $40 a ton more than the wire made in Dusseldorf, Germany, and shipped thousands of miles to Dayton. Last May, 100 lb of American common nails could be bought on our eastern seaboard for about $10.30. European made nails sold in the same area for about $6.90.

• Most of the foreign made steel is being marketed here by American distributors and would continue to be sold that way during a strike.

Since many of the distributors are small or medium sized, few can afford the gamble of heavy inventories in foreign steel in anticipation of a walkout. They'll have to wait for the firm orders.

American producers think that will tend to keep imports down. And if there's no strike or one that lasts a month or less, they're guessing that imports of mill products will drop steeply in the second half, to bring the year's figure to 1.9 million tons. That's a monthly average for all of 1959 of about 160,000 tons vs. the 240,000 tons (estimate) in the first half.

Sums up the export department official previously cited: "Much of the influx of foreign steel that can be attributed to strike hedging has probably already taken place in the early months of 1959."

• An extra copy of this article and one to run May 25 (listing domestic steel facilities that will still be operating in case of a strike) will be available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.

Steel Imports Cause Alarm in East

TWO SHIPS churned down the St. Lawrence Seaway and deposited 8700 tons of foreign steel in Buffalo earlier this month. That was the first of 25,000 tons of foreign steel expected to arrive in the city during a 30-day period.

Only 700 tons were finished steel —the rest is to be rerolled by U. S. companies. In Buffalo, finished foreign steel is available in only a few sizes and shapes; angles are prevalent. Prices are reported as low as $30 a ton below the similar domestic product. Heavy structurals, however, don't come at those bargain prices.

• Who Is Worried? — Answer: Nearly everyone.

Local labor unions see fewer steelmaking jobs in the area.

Buyers of the foreign steel are concerned about the reaction of the public, their unions, and the domestic steelmakers on whom they must rely for the bulk of their needs.

Steel companies face a dilemma. They see part of their market dwindling away, but realize that they will export some steel via the same freighters that bring in the competition. From an international co-operation standpoint, they don't want to oppose the imports. But they don't want to stand idly by while their markets shrink.

Importers, despite their big price edge, report reluctance on the part of some steel users to purchase the foreign material. One marketeer anticipates limitations on imports.

The National Association of Manufacturers may be drawn into the picture to help determine policy. A Buffalo executive says he will ask for an NAM opinion.

Spread Work, USW Urges

With 50,000 steelworkers still idle despite record production, the union is plugging for a four day week every fourth week at five days' pay. Industry sticks to its no-cost-hike stand

THE UNITED STEELWORKERS is putting a spread-the-work proposal high on its list of demands to the steel industry.

It was a major subject on the agenda last week as each side's four man team of bargainers met in New York. Probing actions by both management and labor will be going on in all the major areas of dispute for some time. Brass tacks negotiating won't start much before the end of this month.

• **USW Proposal**—Steelworker President David McDonald's demand is reportedly a four day, 32 hour week every fourth week. The union's 500,000 members in basic steel would maintain the present schedule of five, 8 hour days for three consecutive weeks. In the fourth week, they would work four, 8 hour days under a pay setup designed to give them the same weekly earnings they'd get for five.

The union claims that the plan would cost the companies an added 15 cents an hour in wages. The present pay average is $3.06 an hour. The average workweek would become 38 hours instead of 40.

The reason for the demand: An estimated 50,000 steelworkers are idle at a time when steel production is setting records. Polls of USW members indicate they're more interested in jobs than higher wages.

• **Industry Reaction**—Industry continues to be against anything that would boost employment costs and, in effect, let in more foreign steel (Page 55), or give competitive materials a break, or push up prices.

Both sides are negotiating with the uneasy awareness that a third party may suddenly join them—President Eisenhower—if much more pay-price spiraling looks likely. Industry's basic position continues to be: Keep present wages and fringes for one year but drop the cost of living escalator. Labor's argument: Spread the work, boost wages, and other benefits; they can be financed out of profits, not higher prices.

• **Strike Ahead**—With that kind of positioning, no wonder a walkout is a good bet when the contract expires June 30. A strike or threat of one may be a more potent weapon for the union now than it was a month ago. Steel inventories aren't building up as rapidly as planned, chiefly because metalworking business is much better than expected.

But all indications are that the steel companies will fight to keep at or near the status quo in employment costs.

• **Speculation**—Last week a lot of words were written about the strategy in case of a strike. They boil to this: If the union decides to walk out, it will probably strike the great bulk of the industry as it always has before. In the unlikely event that it decides on a divide-and-conquer technique, the industry is considering several defensive tactics, including what airlines did last year: Extra profits of unstruck companies were divided among those that were struck (STEEL, Nov. 10, 1958, p. 69). Steel firms view the plan with little enthusiasm because of legal problems the airlines didn't face.

Both sides have observed the formality of notifying each other that the contract will expire June 30. You can't read into such a move the threat that the steel industry might lock its workers out (as some observers have). You can't use the formality as firm support for speculation that the steel employees will work into the summer without a contract (as some observes have) because Mr. McDonald says: "No contract, no work."

• **Sidelight on Coal**—The steel companies—like independent coal firms—just gave $2-a-day boosts in their mines. Reporters have been asking: How can they justify the no-raise stand for mill hands? The answer: High productivity which has enabled coal output to keep pace with higher rates.

Left to right are: R. Heath Larry and R. Conrad Cooper of the steel industry's negotiating team and David J. McDonald and Arthur Goldberg of the union's group. Other negotiators are: John H. Morse of Bethlehem Steel Co. and H. C. Lumb of Republic Steel Corp., for industry; Howard Hague and I. W. Abel, for the union

". . . the President indicated that the government must keep outside collective bargaining process . . ."

". . . the top executives should handle the bargaining . . ."

What Secretary Mitchell Thinks

EDITORS' NOTE: STEEL visited Labor Secretary James P. Mitchell last week to get his views on several important problems in the labor-management field. He sees the government following an official hands-off policy in the steel talks; he thinks both labor and management show a great deal of statesmanship; he questions the value of a productivity index to wage negotiations; he believes worker ownership plans can be desirable; he thinks much more planning is needed to handle the effects of automation, but that it will build more jobs in the long run. Here are STEEL's questions and Secretary Mitchell's answers:

In view of world conditions, the state of the economy, and the need to maintain a formidable defense posture, does the government have an official position on major threatening walkouts this year, such as in steel?

"In response to a question on the government's position in the coming steel industry negotiations, President Eisenhower indicated that the government must keep outside the process of collective bargaining. I agree fully. The government's role is to provide a legal framework in which labor-management relations can operate. The free process of collective bargaining, within this framework, is the responsibility of labor and management."

Can the government do anything to assure more statesmanship on both sides in a labor dispute that affects the whole economy?

"I'm not sure the government needs to do anything more to assure statesmanship. It's my conviction that the parties to negotiations which affect the whole economy have a vivid awareness of the third interest present at the bargaining table. I am sure the public interest will be respected by the negotiators in the steel industry and in any other major negotiations. The policy of this administration in leaving negotiations to the parties to the contracts has already done a great deal to increase a labor-management sense of responsibility."

Do you see any signs of increasing "statesmanship" by either side?

"I do. In this country, some 125,000 collective bargaining contracts are in effect. Thousands are negotiated each year. Better than 90 per cent are arrived at peacefully. The record of labor relations in the last six years is a good one—there has never been in our recent peacetime history a period in which so small a percentage of our total worktime was lost due to strikes . . . I think it reflects the steady progress we have been making. It implies a growing recognition of the public interest involved in bargaining."

Looking ahead to the '60s and '70s, do you see the labor leaders

". . . I question the value of (a productivity) index to labor-management relations . . ."

". . . in the long run, automation builds more jobs . . ."

about 1959 Labor Issues

and industrial relations executives of those times possessing particular characteristics different from those of today?

"In general, I believe the labor leaders and business leaders of the '60s and '70s will not need training or ability much different from their 1959 counterparts . . . Labor and management are starting to get together away from the bargaining table—to exchange ideas on a wide range of topics apart from those taken up in negotiations—and I think this interaction should, and will, continue . . . (But) too many companies relegate their bargaining duties to a legal assistant or a man far removed from the top policy staff of the organization. It's time they realize that their labor-management relations are just as important to their success as sales or production. The top executives should handle the bargaining and should talk ideas and viewpoints . . . (then) technicians can draw up a written agreement."

Can the government (perhaps the Bureau of Labor Statistics) come up with a widely recognized productivity index similar to the price index or the Federal Reserve Board's industrial production index?

"The consumer price index has many years' experience behind it, and the BLS, because of efforts of past years, is able to produce estimates and totals. The nationwide productivity index we now have is still in its infancy, and all the wrinkles haven't been worked out of it yet. The basic data needed . . . are not yet as complete as the experts would like. I question the value of such an index to labor-management relations, though. The nationwide index gives a picture of the position of the over-all economy—an averaging out of what may be substantial rises in some areas and industries against what may be losses in others. It has value in making comparisons on the national level . . . but its use in bargaining . . . seems . . . minor."

Do you believe output per manhour is a fair measure of productivity?

"There are various ways of measuring productivity. Output per manhour is one method; output per unit of capital investment is another; and output per unit of capital investment plus manhours is still another. No one method can be called best. Whatever system is used depends upon the purpose you have in mind. If you were analyzing total costs, you would need all three. If you were working to get a picture of labor requirements, you would find the output per manhour method more suitable."

What other factors should be considered in measuring productivity?

"The factor I just mentioned—units of capital investment—is probably what you have in mind . . . To find out if one individual is doing more or less today than he did yesterday with the same machine, the output per manhour method is fine. If he now has a new machine, the analysis would be of the economic value of the product that comes off the new machine compared with the old. To do this, you

must weigh the output per man-hour with other factors of changed investment and costs of operation."

Do you have any opinions about "people's capitalism" as expressed by some industrial leaders in profit sharing, stock option plans for production workers, and savings plans where the company contributes to an employee's savings account?

"In my opinion, broad based corporate ownership is, in general, a desirable thing. I don't think it matters a great deal what form the distribution of ownership takes—profit sharing, stock option plans, or something else—but it is another step in strengthening democracy through removing economic distinctions between groups . . . these worker ownership plans are an excellent answer to the vicious picture of American life painted by the Communist propagandists. Whether a particular stock option or profit sharing plan is desirable from the standpoint of the employer or the workers depends upon the facts in any particular case."

Are any of us—government, management, labor—doing enough about preparing the country for the "age of automation"?

"We are not doing all that should be done. We need much more planning to handle the effects automation will have in a few years. Communities must be prepared for the changes in manpower requirements of the industries in their areas and must take steps to attract new industries and employment opportunities to pick up the slack created by increasing mechanization. In the long run, automation builds more jobs—but in different trades, and often in different localities. These dislocations should be thought through in advance by management, labor, and the community, so that transitions . . . will be as smooth as possible. Management and labor have often neglected positive aspects of manpower needs . . . As the complexity of the machinery grows, the skills and training needed to operate these machines grow too. Shortages in some occupations exist today. These shortages will become more acute if the coming manpower needs aren't analyzed carefully and steps taken to provide the men who will be needed."

Brass Sales Do About-Face

BRASS MILL shipments are on the rebound, reversing a downward sales spiral which began in 1955 and continued through last year. That's the consensus among the more than 125 top level brass mill executives who attended the 37th annual meeting of the Copper & Brass Research Association meeting in Hot Springs, Va., last week.

Figures show a sharp rise in first quarter shipments. Officials believe sales will continue at an improved pace over the remainder of the year, but caution that it's still too early to accurately predict if the trend will continue.

• **Ailments**—The industry pulse is still erratic. Industry people point out that copper and brass fabricators' return on investment now averages only about 6 per cent. Equally significant: Per capita brass mill shipments have slumped in recent years because of zooming imports and increased competition from other materials.

Look at these examples of spiraling imports: Foreign brass tube producers stepped up shipments to the U. S. from 300,000 lb to 33.5 million lb between 1949 and 1958. In the same period, copper tube imports grew from less than 500,000 lb to over 46 million lb. Between 1956 and 1958, sheet copper imports jumped from 17 million lb to almost 38 million lb. Foreign brass mill goods now account for 20.6 per cent of U. S. usage mainly because domestic wages have risen 80 per cent in the last ten years, making it possible for foreign producers to bring in items at a lower cost.

The industry believes its best formula for long term improvement and growth lies in this direction: "Sensible" tariff barriers to hold down the flood of imports, stepped up advertising, sales promotion, and market research programs with the twin goals of new product development and recovery of certain markets which have fallen victim to other materials—principally aluminum.

• **Enough Metal**—In the years ahead, the brass mill industry probably won't be plagued by the troublesome copper shortages of the past. That's the good news relayed to delegates by Simon D. Strauss, vice president-sales for American Smelting & Refining Co. Mr. Strauss also reported that extreme fluctuations in copper prices probably won't be so violent in the future. Reason: New mines coming into production which may hike Free World copper output to 3.5 million tons by next year.

Scrap Research Proposed

Committees of the American Iron & Steel Institute and Institute of Scrap Iron & Steel Inc. are considering a long term research study aimed at improving scrap quality and increasing the efficiency of its use.

Battelle Memorial Institute, Columbus, Ohio, would conduct the study.

Opens New Testing Plant

New and expanded heat treating facilities for experimental and pilot plant operations were opened last week at Electric Furnace Co., Salem, Ohio.

In the new 80 by 180 ft building adjacent to Electric Furnace's main plant, studies will be made of continuous and batch heat treating equipment, special protective atmosphere facilities, and industrial furnace metallurgical and chemical problems.

One bay of the building houses a production size, continuous roller hearth, strip line which can process coiled strip up to 26 in. wide. With the pilot plant model, Electric Furnace can make production studies of heat absorption rates of different strip surfaces, annealing, and normalizing and soaking temperatures.

Besides a number of small experimental furnaces, the research plant also contains a new continuous vacuum furnace, introduced by Electric Furnace in March for production heat treating of tantalum, titanium, zirconium, high carbon and stainless steel strip.

In addition to the pilot models for production studies, the facilities also contain laboratories for quality control analysis and a darkroom for processing photomicrographs. The research facilities are available to metal producers and processors for test and development work.

Coal Industry Sees Good Years Ahead

OPTIMISM was evident at the American Mining Congress' Coal Show in Cleveland last week. Booths were busy and enthusiasm was high. "This is the best show we've had in several years," declared a sales manager.

Exhibitors queried by STEEL predicted a definite business upturn this year. Heavy equipment makers estimated a 10 to 30 per cent improvement over 1958. Underground mining equipment manufacturers weren't that optimistic, but nobody registered pessimism. "We'll be up, but I doubt if we'll make 10 per cent," mused a company official.

• **Good Years Ahead** — Numerous conventioners foresaw an upswing in the coal industry. Equipment people reasoned that the needs of a rapidly expanding population combined with more automation in the industry would boost sales. Heavy equipment firms proclaimed federal road building projects would help their sales.

Several new pieces of equipment caught the miners' fancy. LeTourneau-Westinghouse Co., Peoria, Ill., showed its mammoth Model 80 Haulpak. Capacity: 80 tons. Top speed: 40 mph. The truck is capable of carrying enough coal to fill over one and a half standard 50 ton railroad hopper cars. Joy Mfg. Co., Pittsburgh, introduced a remote control operation of its Twin Borer which enables the operator to direct the machine from as far as 50 ft away. Several companies unveiled low seam continuous mining equipment with new refinements.

Sidelight: German mining equipment attracted much traffic.

ASMMA Elects Officers

New officers of American Supply & Machinery Manufacturers Association: President, Fred C. Emerson of Spartan Saw Works Inc., Springfield, Mass.; first vice president, Samuel D. Conant of Jacobs Mfg. Co., West Hartford, Conn.; second vice president, Paul A. Johnson of Drake Corp., Grand Haven, Mich.

Castings Take Airline Job

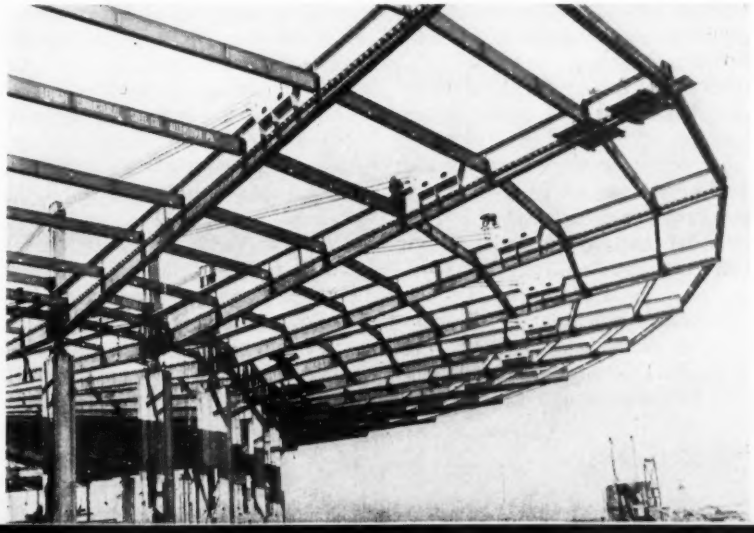
GIANT malleable castings will be used in supporting structures of the $8 million terminal Pan American World Airways is putting up at New York's International Airport.

The terminal's reinforced concrete, cantilever roof will cover the passenger and freight terminal and an airliner size parking area where planes will unload. The terminal was designed by Tippetts-Abbett - McCarthy - Stratton, New York.

Sets of four malleable castings are mounted on 32 concrete columns (above) supporting roof and canopy. In each set, the two bottom castings weigh 725 lb apiece; the center casting weighs 660 lb; and the top one weighs 550 lb. They are the largest structural castings ever produced for this use by Lehigh Foundries Co., Easton, Pa. ASTM Grade 35018 ferritic malleable went into them.

They were annealed in 30 hours to Bhn 160.

The 4 acre roof skeleton (below) provides a canopy 114 ft deep. Under the "umbrella," fabricated by Lehigh Structural Steel Co., Allentown, Pa., a fully loaded airliner can be unloaded every 15 minutes.



Here's Small Company's

1. **Don't expect to bat 1000. A 500 batting average is better than normal.**
2. **Be prepared to be surprised. Sometimes what looks hot on the drawing board fizzles out in the market. A less exciting project may prove to be a bonanza.**
3. **Give a new product a fair trial. Often it takes several years for a good moneymaker to catch on.**
4. **Make sure that a contemplated new product is better**

Market Forge Pins Growth on R&D

PRODUCT research and development is an important growth tool for any size company.

That's the philosophy of Market Forge Co., Everett, Mass. (Employment: About 300.) It rode out turbulent financial weather with an R&D program that fits its objectives.

• **Stormy Waters**—Ten years ago, Market Forge was floundering in the postwar buyers' market. Heavy wartime capital investments and an expanded work force made it difficult for the company to look with composure at the widely fluctuating demand for its shelving and hospital equipment.

To turn the tide, President Leo Beckwith departed from the company's 50 year tradition of being a job shop and set out to make it a full scale manufacturer. The building of a research and development department was part of the move.

Here's the company's concept of how R&D should operate: It works along preplan lines. Management determines what products customers want by contacting salesmen, customers, ultimate users, and distributors. If a project looks feasible, it is turned over to R&D.

Research people are handed only "really tough problems." Says Mr. Beckwith: "If the problem is easy, anyone can solve it. If it's tough and we crack it, we know we have something good."

• **Find Out What's Needed**—Look at this step-by-step playback of how Medi-Prep, a new product for hospitals, was developed.

By observing activities in a local hospital, the company found that nurses seemed to spend needless time in preparing and dispensing medicines. Other nursing duties suffered.

Market Forge engineers worked with a management consulting firm on time studies of nursing activities in Boston area hospitals. The flow chart showed a great waste of time. Some simple functions required 15 separate operations. Proper layout could eliminate 11 or 12 of them. The study showed that facilities required in storing and preparing medications included several separate units, often some distance apart. For instance: A work counter would be in one room, a sink in the next, the medications in a wall cabinet in the same room with the work counter (but not necessarily near it). Narcotics would be locked in a nurse's drawer. Some bottles were kept in a refrigerator in the diet kitchen down in the corner (in some instances, on a different floor).

Conclusion: Nurses spent more time moving from one place to another than they did preparing medications. Routine was interrupted by contact with other people while en route, decreasing efficiency.

Market Forge's product development engineers set out to solve the problems by incorporating all the facilities required for medical storage and preparation in one stainless steel unit. The Medi-Prep contains a narcotics cabinet, tiered

Blueprint for Product R&D

than, and different from, any existing product it will compete with.

5. **Smaller companies should put R&D under the chief sales executive. He'll have a good idea of what will and what won't go on the market. If experience tells him a product hasn't a chance of catching on, months of researching in some cases can be avoided.**
6. **Give a new product the benefit of solid marketing study and strategy, including pricing, merchandising, distribution, and promotion.**

medicine shelves arranged so most medicines are within sight and reach, a 4 cu ft refrigerator for storing biologicals, a sink, waste container, and syringe drawer.

Sales of the $1500 item have spiraled. Company officials say many hospitals have purchased it on the strength of direct mail pieces alone.

An automobile back rest designed to minimize driving fatigue and backache is another example of how Market Forge put R&D to work. It was developed through the joint efforts of R&D men and orthopedists. Before its introduction on the market, several taxicab companies tested it.

• **Growth** — The company's first proprietary product which showed real potential was the steam pressure cooker. For many years, Market Forge made one which was marketed by another firm. In 1948, management decided that the product area was ripe for exploitation. R&D people came up with a series of new approaches to steam cookers. By 1951, sales were booming.

Another example: Market research studies showed consumers felt that luggage carriers (the type which is mounted on the top) were unattractive; they were costly to manufacture and difficult for consumers to assemble. Market Forge's R&D department developed a method of making carrier crossbars with one piece of embossed, 20 gage steel instead of 11 gage. Costs were substantially reduced, and the product was stronger and more appealing to the eye.

• **How Successful?**—The company claims to be the country's largest manufacturer of top carriers and one of the two largest producers of commercial steam cookers. Unlike most firms, Market Forge did not have a recession. Sales have climbed every year since 1948. In the last five years, the firm has tripled its annual volume (presently $6 million).

Mr. Beckwith credits effective use of research and development. "If a company finds products that are really needed, designs and manufactures them better than anyone else, then it is sure to grow."

He ridicules the notion that R&D is only for the corporate Atlas. "Too many smaller companies have been intimidated by the fact that larger corporations can devote more money to research and development. This is a needless kind of fear. In most instances, the larger and smaller companies do not operate in competitive areas."

• **Danger Ahead**—But a superior product is not a guarantee of success. Mr. Beckwith feels that too many companies put an unrealistic premium on the apparent security of a patent. They peg the price as high as the traffic will bear in the hope of amortizing capital investments long before the bubble bursts. Too often, patents do not prevent competition from moving in with a lower priced product.

"We price our goods as low as good design and sound profit planning allow," he says. "We are in no hurry to amortize our investment. We make sure our new product decisions are the right ones. Then we put our minds at ease. With a really low price, we are able to get a solid grip on the market. Anyone else who wants to jump on the bandwagon is going to have to run awfully fast to catch up."

Scovill Opens Tube Mills

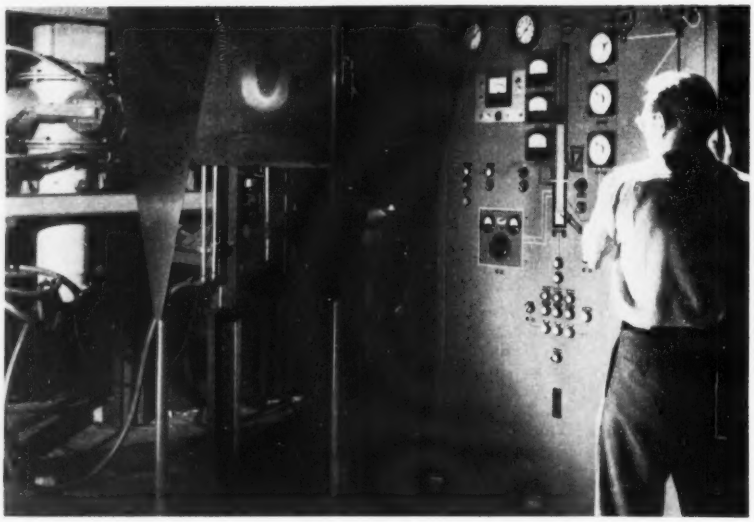
Scovill Mfg. Co., Waterbury, Conn., officially opened its $10 million tube mills in New Milford, Conn. The new facilities will permit extension of its product line to include copper tube and pipe for plumbing, heating, and air conditioning applications. In the heat exchanger tube line, lengths up to 100 ft can be furnished from New Milford, compared with 40 ft from the former Waterbury tube mill. The firm's general commercial brass alloy tube is continued and augmented to fill requirements where fine surface finishes and close tolerances are of primary importance.

Chromalloy Ups Capacity

Chromalloy Corp., White Plains, N. Y., boosted production capacity by about 30 per cent with the addition of furnace, mixing, and retort equipment; a battery of high temperature controls; and a complete compound preparation unit. The firm's patented process is a method of increasing the heat, wear, and corrosion resistance of metal parts by a diffusion of chromium and other elements into the surface.

Cost Breakthrough for Vacuum Steel?

Producers try to trim expenses and meet expected demand with furnaces two to four times larger, more efficient handling, wider range of grades



Latest General Electric design for vacuum arc furnace has a quick change mold (bottom left), steam ejection. Since there's no treelike superstructure, operations are streamlined

"TOOL STEEL buyers are going to demand a wide variety of vacuum arc melted grades within the next three years," says Arthur E. Johnson, chief engineer, Elkhorn Plant, A. O. Smith Corp., Milwaukee.

"The performance of some vacuum melted grades is going to impress tool and specialty steel buyers," says L. W. Johnson, product and process development engineer, General Electric Co., Shelbyville, Ind. "The evidence points to increasing interest in wider selections."

A STEEL survey of steel producers reveals widely divergent reactions to those opinions. Responses range from skepticism to outright endorsement.

One of the "big three" producers told STEEL that its present melting capacity is going "like a house afire." It expects to increase capacity within a few months.

• Activity in the field lends support to the contention that such steels have a potent future.

Consider these developments: In the last six months, U. S. Steel Corp. has entered the market place with a 32 in. furnace which melts a 12 ton ingot. And it's planning a 44 in. installation. Bethlehem Steel Corp., on the fence so far, is expected to make up its mind on two 30 in. furnaces. Both Latrobe Steel Co. and Vanadium-Alloys Steel Co., Latrobe, Pa., have just opened sizable additions.

Most producers agree that high performance steels will probably be vacuum grades. Kenneth Iverson, sales manager, Cannon-Muskegon Corp., Muskegon, Mich., says, "Most high grade steels will probably be made by vacuum arc within ten years." A few, like Crucible Steel Co. of America, Pittsburgh, estimate only 2 per cent of all high grade alloys will be made that way.

Furnace builders report bids on or construction of 40 in. and 60 or 65 in. designs. One is sketching a proposal for an 80 in. furnace to handle rotors for giant steam turbines.

Says Lectromelt Furnace Div., McGraw Edison Co., Pittsburgh: "The industry has had a widespread misconception that vacuum arc melting adds a prohibitive premium to production costs. Recent developments show it's economical and consistently effective when handled by competent melters."

• Today's pricing structure reflects the neophyte status of the industry.

Many producers, especially those who melt titanium and zirconium, report they produce alloy steels on a bid or contract basis at 40 to 50 cents (premium) a pound. Some of the larger producers, who are primarily interested in steel, get considerably less as a premium (20 to 25 cents, depending on the alloy).

Experts say the wide range is due to the equipment and experience of the producers. An efficient furnace means a low price and could be the reason behind cries of "cutthroat."

Both design and size contribute to efficiency. Some of the newer designs enable one man to operate two large furnaces. Ingot handling convenience is another element in

downtime. Today's melting costs range from 25 cents a pound to as low as 4 cents. One furnacemaker claims he'll chop more off that.

• Not all steel alloys can be vacuum melted efficiently.

Some types, like A-286, can only be made in a vacuum. But of those grades that can be handled that way, the producer has a built-in bonus: Increased yield. Take some grades of stainless. Crop loss in air melting and processing could run 35 per cent. Casting the air melt as an electrode and remelting can cut that to less than 15 per cent.

Result: The producer has one-third more stainless for sale from the same raw materials. At $1000 a ton (warehouse price), that means an extra $300 is available to justify vacuum remelting. That's 15 cents a pound—more than enough to attract a producer who is anxious about costs.

In certain grades then, a producer may vacuum melt and offer the product for no other reason than plant efficiency. Such experience can lead to availability of a wider range of steels.

One major producer is expanding rapidly in vacuum melted carbon steels, particularly the low alloy grades. His major customers are aircraft and missile makers, but he feels other industries will become interested once they learn the benefits.

• You must balance cost knowledge with a broad outlook.

Although a melting cost of 4 cents appears unreasonably low to some producers (one cried "silly"), there are those who readily admit that present costs might drop to 10 or 15 cents a pound (premium) when larger, more efficient furnaces are available. In any case, it is well to remember that the 4 cents represents bare melting costs; it doesn't include the extensive promotion which must be justified on meager tonnage. And don't forget that the initial investment is high: A 40 in. furnace costs around $700,000.

But the implication seems clear: Once initial investments and know-how problems are cleared up, and the volume increases, the price could decline.

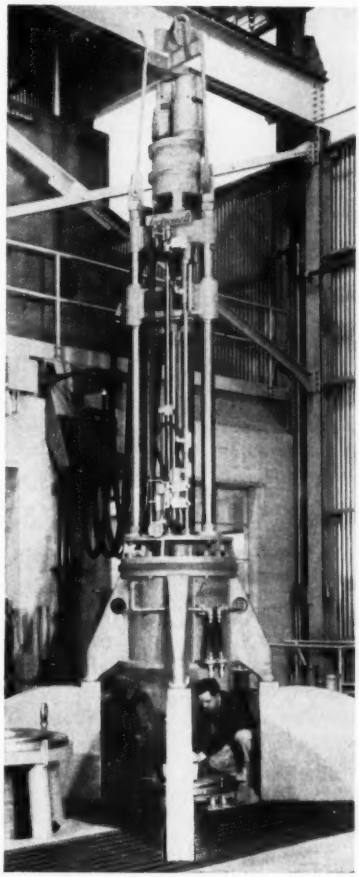
Latrobe Installs Vacuum Arc Furnace

A CONSUMABLE electrode, vacuum arc furnace has started full production of tool steels and superalloys for Space Age applications at Latrobe Steel Co., Latrobe, Pa.

The unit was installed by Lectromelt Furnace Div., McGraw-Edison Co., Pittsburgh, in a new building which will house Latrobe's vacuum melting department. Two more furnaces will go in later.

• Furnace height is held to a minimum with large diameter crucible and electrodes.

The unit remelts electrodes 16 in. in diameter in a 20 in. crucible, producing ingots as large as 8500 lb. An 8 ft ingot is produced from an electrode about 12½ ft long.



Electrode and crucible go into place. Downtime between melts: Only 20 minutes

Low over-all height keeps all operations on one level. The furnace is operated by two men; two units, side by side, would need three.

• Pilot plant operations provided experience in vacuum melting and preparation of electrodes.

J. E. Workman, executive vice president, notes that the pilot plant, producing 600 lb ingots, was in operation more than two years. It produced limited tonnage for Latrobe's customers and provided valuable training for personnel.

Technicians had little difficulty changing over from the pilot unit to the newly installed furnace, says R. T. Eakin, vice president-operations. The first melt was made only a few hours after final inspection.

Nuclear Tester Developed

Plutonium 239 is being used to measure the moisture content of molding sand at GM's Central Foundry Div. plant in Danville, Ill. The technique utilizes fast neutrons emitted from 32 grams of plutonium mixed with beryllium powder and sealed in a stainless steel capsule. Fast neutrons collide with hydrogen nuclei in water atoms in the sand, producing slow neutrons that can be counted electronically. The number of slow neutrons is directly proportional to moisture content.

"This new sand moisture gage has substantially improved our ability to make sand molds of uniformly high quality. It permits us to maintain a more exact moisture content and is expected to correct a variety of foundry problems," declares James H. Smith, Central Foundry's general manager.

Before the nuclear device was installed, moisture control depended on an experienced operator's hand test or "feel" of the sand. The new gaging is almost entirely automatic. The neutron source pellet is lowered into the center of each 3200 lb hopper of molding sand through a stainless steel tube. Two neutron detectors in the tube count the hydrogen nuclei in about 45 seconds.

Moisture content is indicated on a dial which also shows quantity of water needed. The muller operator pushes a button to drop the sand from hopper to muller. With a second button, he meters the desired amount of water into the muller.

More Aid for Small Business Investors?

LOOK for Congress to amend the Small Business Investment Act, passed last year (STEEL, Sept. 15, 1958, p. 107). Object: Make it easier for investment companies to be formed. Main target of the small business enthusiasts: Bigger profits for the investment companies, so they, in turn, will help more small firms.

Wendell Barnes, small business administrator, last week reported to Rep. Joe Evins's (D., Tenn.) Small Business Subcommittee: 1. SBA has received 67 investment company proposals of organization under the act. 2. It has approved 34. 3. Only three investment companies have completed all the organizational work and issued licenses. 4. Fifteen proposals have had to be revised to meet the act's standards. 5. SBA is reviewing 15 more proposals. (Between the time SBA approves a proposal and a license is issued, the organizers clear with the Securities & Exchange Commission, the Federal Reserve Board, and the Internal Revenue Service—and secure their state charters.)

Mr. Barnes was, in essence, replying to criticism by Rep. Wright Patman (D., Tex.) that his agency has been moving too slowly. Congressman Evins referred to charges of "red tape" received by his subcommittee against the administration of the act. Mr. Barnes claimed: "Our experience to date, or rather the lack of it, does not justify the recommendation of any major change" in the act.

How Should the Act Be Changed?

Mr. Barnes did offer some minor changes. First, he wants to eliminate the requirement that small firms receiving equity capital from an investment company must purchase stock in that company equal to 3 to 5 per cent of the capital provided. Secondly, he thinks investment companies should be able to finance small firms through other means than convertible debentures or loans (as now restricted by the act). Common stock, for example, should be acceptable. And he wants small business investment companies to be allowed to make more long term loans.

Association Wants Extensive Changes

The National Association of Small Business Investment companies asks for several major amendments: 1. A flexible interest rate on funds advanced by SBA to SBI companies (based on costs of the money to SBA). 2. Loans to SBI companies without regard to their ability to obtain financing elsewhere.

Thomas Grant Jr., president of the association (and a North Carolina banker), reports interest in the SBI program is decreasing. He thinks some tax changes are needed, too.

Sen. John Sparkman (D., Ala.) has a bill calling for the exemption of SBI companies from accumulated earnings taxes where their earnings are reinvested. Mr. Grant backs this, too. Meanwhile, Representative Patman appears to be doing an end run around the act by calling for the creation of a Small Business Capital Bank System (H.R. 6594) "to increase the availability of capital" to small outfits.

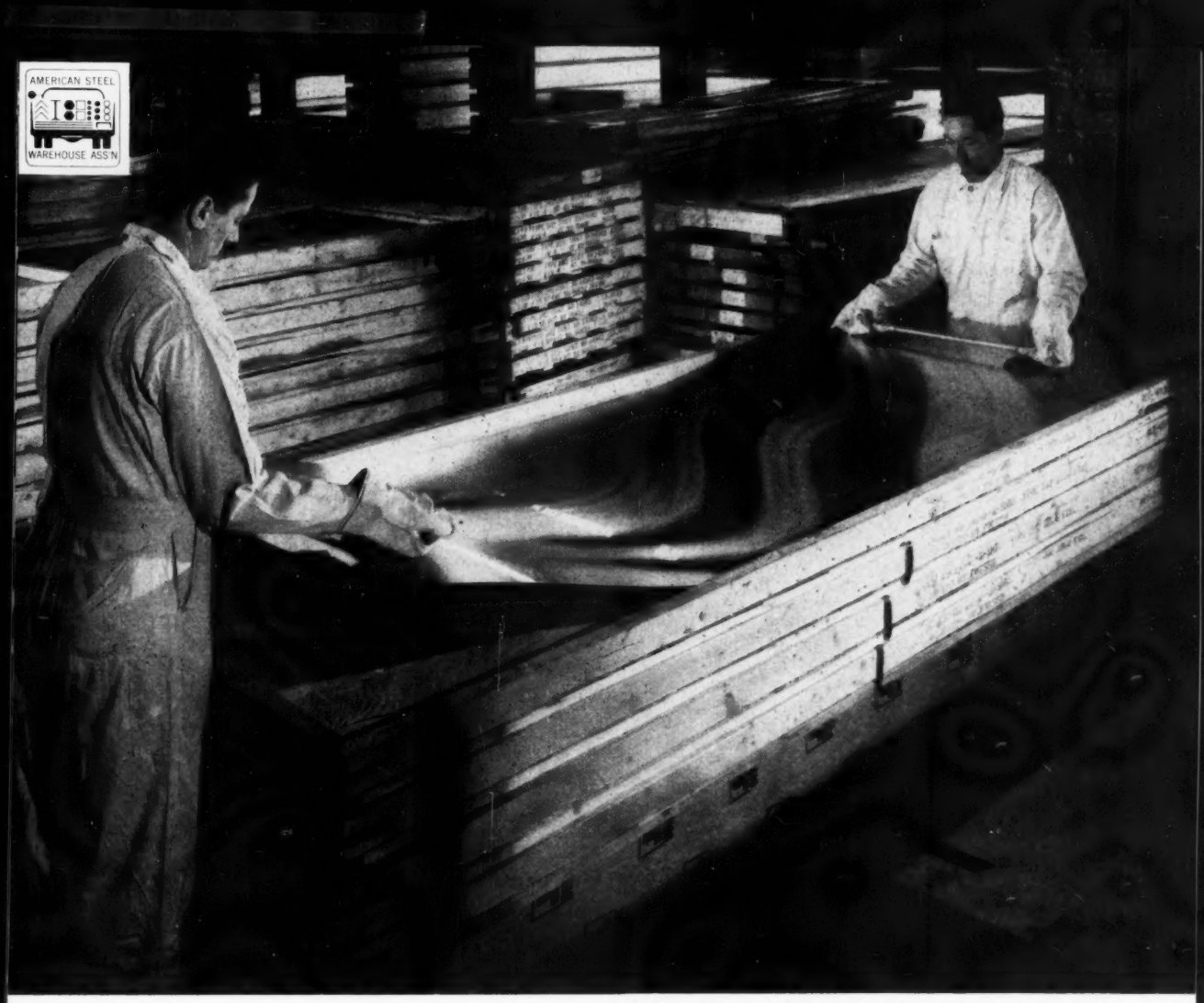
Nickel-Cobalt Hassle Back Again

Don't ever expect Rep. Jack Brooks (D., Tex.) to let go of an issue once he really has his teeth in it. He is after Freeport Sulphur Co. again. This time, though, the Louisiana Congressional delegation thinks he is going too far: Freeport's refinery for nickel and cobalt from Moa Bay, Cuba, is located at Braithwaite, La., and will provide 560 jobs in Rep. F. E. Hebert's (D., La.) district. Charges Representative Brooks: Freeport bought the $6 million, government built plant for $200,000 and stuck Uncle Sam with the obligation to buy $248 million worth of nickel and cobalt, while the nickel shortage is over and poor Sam has cobalt running out his ears.

Rep. Gracie Pfost (D., Idaho) says Idaho's Calera mine is about to go out of business because Uncle won't pop with a cobalt contract. She wants to know why Calera gets nothing when it'll meet Freeport's price of $2 a pound.

Freeport's Case

Congressman Hebert reported Freeport bought the Louisiana plant in open bidding against 18 other firms. He noted, too, that Freeport had originally advised the government not to build the plant because Freeport had already perfected the process in its own privately financed pilot plant. Argued Charles Wight, Freeport's prexy: Moa Bay involves no government loans. Unless production is put to the government under the contract's provisions, Uncle Sam may never have to buy any of the nickel and cobalt. If he does have to buy, it will be at 74 cents a pound for nickel and $2 a pound for cobalt (the market price at the time the contract was signed in 1957), which compares favorably to contracts the government has joined at prices as high as $1.44 a pound for nickel and $2.67 a pound for cobalt.



Handling stainless steel sheets with suction cups and protecting stainless surfaces with paper are standard practices at J & L Steel Service Centers.

Extra Care at "The Department Store of Steel" prevents damage...saves you time and money

● *Extra care* is standard practice at your J & L Department Store of Steel. This includes handling stainless sheets with gloves, lifting with suction cups to avoid marring the surfaces, as well as careful packing with paper interleafs and delivery in protective crates, properly identified.

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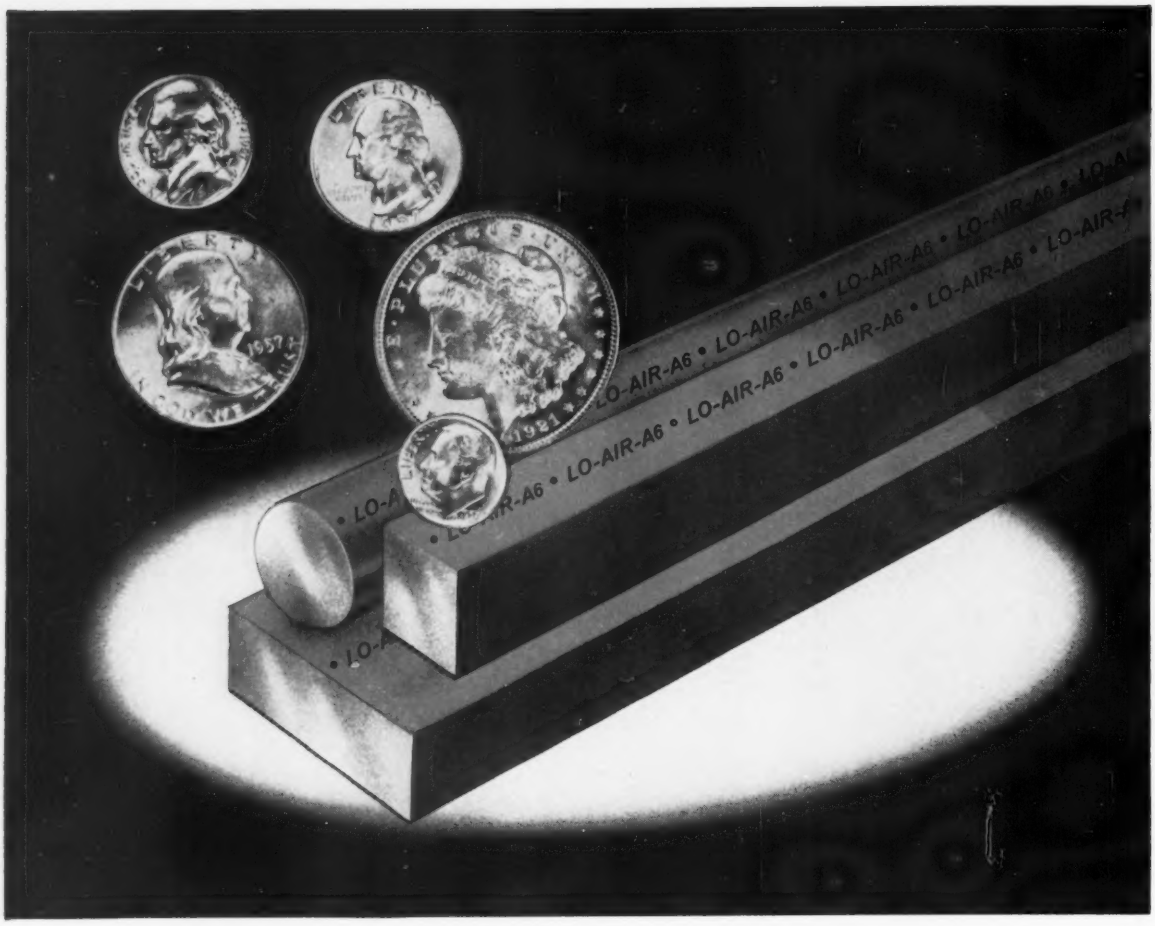
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Foundry Equippers Can Smile Again

FOUNDRIES will ship more castings this year. Will that stir them to buy much more equipment?

The best gage of what's happening so far is the Foundry Equipment Manufacturers' Association index (see graph), representing one of the industry's best first quarters since Korea.

These firms watched bookings climb from 30 per cent to 157 per cent through the first quarter, over the year ago period: C. V. Nass, general manager of Beardsley & Piper Div., Pettibone Mulliken Corp., Chicago, says that orders from December to April are 157 per cent above the year previous, and 34 per cent up from the comparable 1957 period. Edmund Hatch, manager of machinery and sales, Osborn Mfg. Co., Cleveland, reports orders running 100 per cent above a year ago and about on a par with the first half of 1957. With backlogs double those of a year ago and inquiries way up, Mr. Hatch finds "people are starting to forget about the recession."

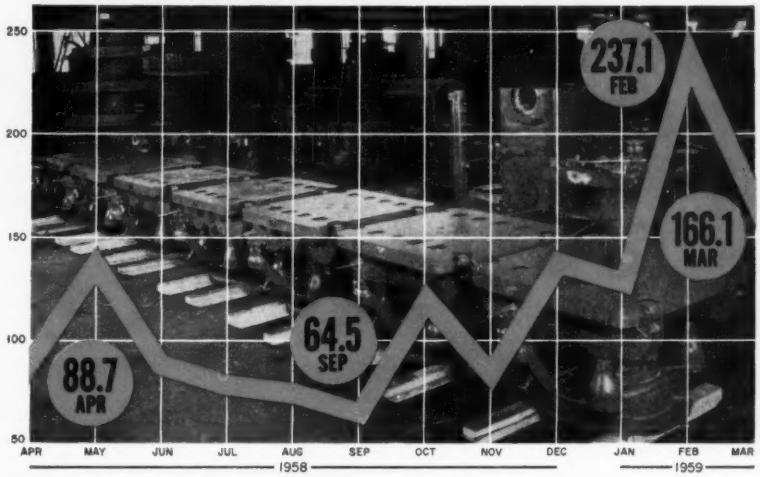
National Engineering Co., Chicago, sees business up 30 per cent from a year ago, but down 10 per cent from two years ago.

If the second quarter sees buying level off around 175 per cent of the 1947-49 average, there will be plenty of smiles among builders of blast cleaning equipment and coremaking, molding, and diecasting machines.

• **FEMA Prexy Reports**—Here's an analysis of the outlook from Gordon E. Seavoy, vice president, Whiting Corp., Harvey, Ill., and president of FEMA. "Our selling activity is as high today as in 1957, but there are fewer closings." Whiting normally closes one of every five projects it discusses with customers. Today it is being told, "we'll wait and see." Mr. Seavoy is waiting for "something, perhaps a return of public confidence, to trigger" more capital goods sales. "Then there will be a flood of orders," he says.

• **10-15% Better**—How soon will the flood come? There's a chance a small car from Detroit will help, but the best he expects in 1959 is a 10 to 15 per cent increase over 1958's sales. Whiting's business last year was one-third off its 1957 pace. He thinks "the rate of buying in the last quarter of 1959 will be pretty high," and hopes for a return to the 1957 rate in 1960. Supporting that view is Wheelabrator Corp., Mishawaka, Ind., whose first quarter is up 30 per cent over the like 1958 period.

ORDERS INDEX: 1947-49 equals 100



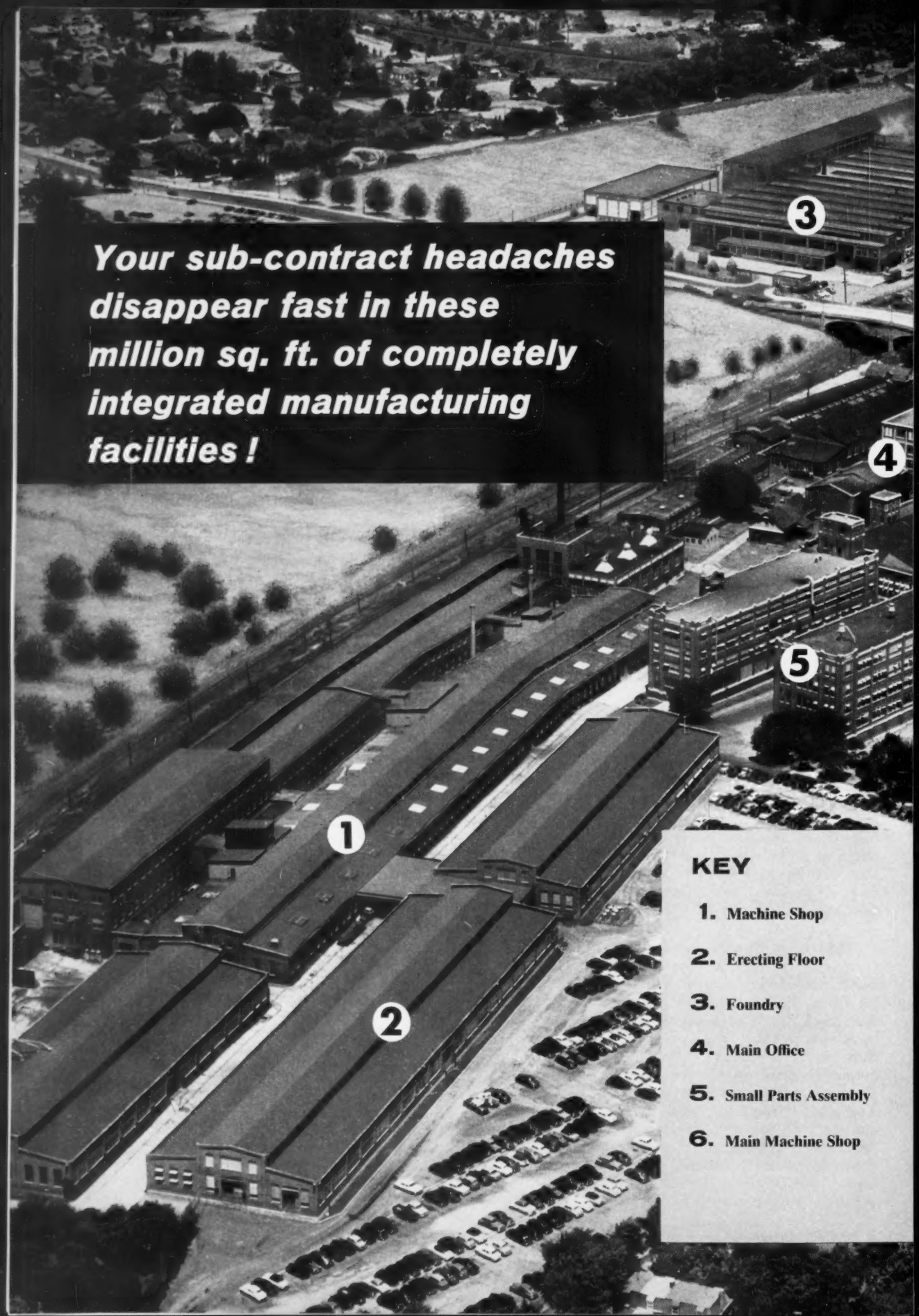
Source: Foundry Equipment Manufacturers Association.

• **Prices Due to Climb**—Equipment prices were cut sharply during the recession just to bring work into the shops. Producers still say they are highly competitive. Most manufacturers are marking time to see what happens in steel; they expect increases in the third quarter. Some companies lifted prices in the first quarter from 5 per cent to 7½ per cent; another will hike his rates in the next 30 days for the first time since 1956. Since orders for heavy equipment resulting from current bids won't be fabricated until the third quarter or later, the bids contain a 5 to 10 per cent anticipated price rise.

Equipment makers are also waiting for the foundry industry to pocket a significant increase in profits: "It takes money to buy equipment," says a Commerce Department source, "and while business is better for the foundries, they aren't experiencing a profit upsurge. Price cutting during the recession kept even the foundries that were able to maintain a fair operating rate from saving money to re-equip."

• **Dollar Volume**—Preliminary figures from the Census Bureau show foundries spent $144 million on new plant and equipment in 1957. That compares with $136 million in 1956 and $115 million in 1955. Roughly 80 per cent of the total goes for new machinery and equipment: $115 million in 1957; $105 million machines are selling the best now. in 1956; $90 million in 1955. Spo Inc., Cleveland, reports automatic machines are selling best now.

The FEMA index declined about one third from 1957 to 1958. Using the same ratio, volume of machinery sold to the foundry industry last year would run about $75 million. For the first quarter of 1959, the FEMA index is averaging 176.9 of the 1947-49 base period. If the rate could be maintained, sales would come close to doubling this year over last. A return to 1957's rate may be the most an optimist can expect, and some of STEEL's more pessimistic sources feel that can't happen until 1960.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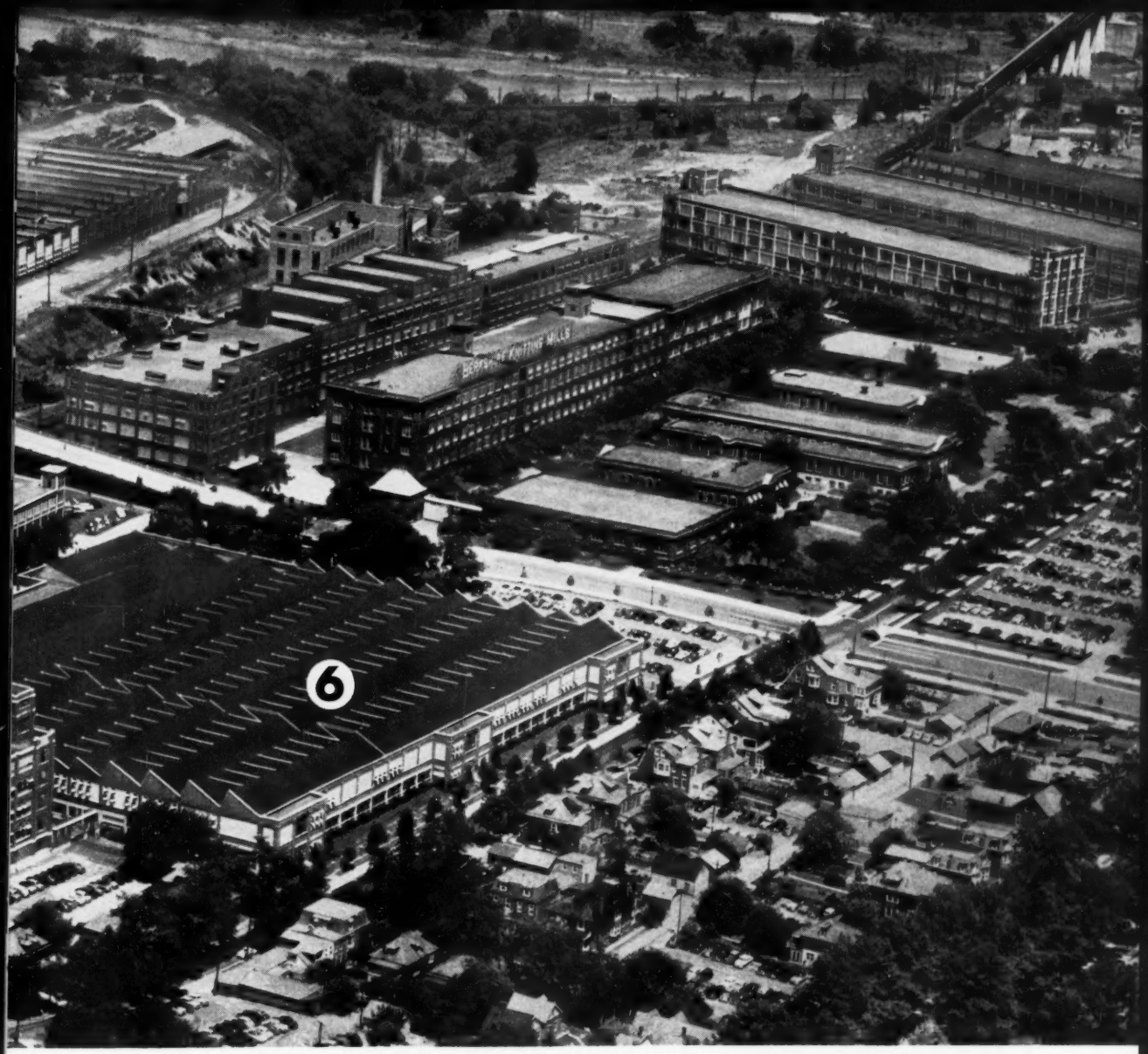

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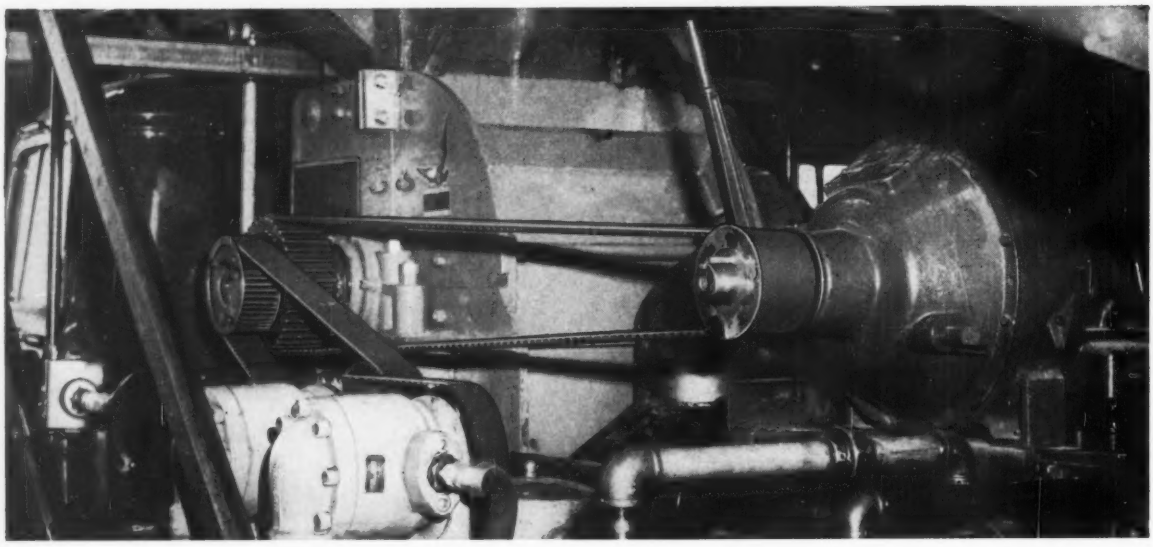

When a mining company started to isolate minerals from a 200,000-ton pile of mine tailings in New Mexico, they used 2 mobile rigs each equipped with a conveyor. Power transmission turned out to be the worst headache. Space was narrow, power needs high, belt speeds extreme. But U. S. PowerGrip "Timing"® Belt met all the needs:

Installed on engine driving crusher and hydraulic pump, U. S. PowerGrip handles speeds no roller chain could handle. A chain drive always involves lubrication problems. V-Belts would need larger pulleys, which would place belt speed outside of V-belt range. Jackshafts and several bearings would have been needed for any other transmission medium, with resultant expense and space consumption. PowerGrip abolished these problems.

With PowerGrip, the company was able to keep belt speeds up to 7,000 feet per minute.

• PowerGrip has no slippage, no take-up • Absence of metal-to-metal contact eliminates need for lubrication and housing • Handles speeds up to 16,000 f.p.m. • Close to 100% efficiency.

Stock drives are available from U. S. PowerGrip "Timing" Belt Distributors, to convert any drives from fractional to 1,000 horsepower.

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US RUBBER **United States Rubber**

WORLD'S LARGEST MANUFACTURER OF INDUSTRIAL RUBBER PRODUCTS

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Ford's Researcher Robert Eggert

How U.S. Car Market Will Grow

(Millions of units)

	Total Registrations	Projected Annual Sales
1975	82.6	10.7
1970	72.6	8.8
1965	63.1	7.6
1960	55.2	6.4

Source: Ford Div. market research staff.

Risk Reduced with Market Research

FORD MOTOR CO. spends an average of $1 per car annually on market research. For this relatively small investment, Ford is getting information it believes will help to maintain the kind of sales it's ringing up this year. The success of 1959 Fords can be traced in part to marketing research studies.

Robert J. Eggert, Ford's marketing research manager, is reluctant to reveal all his findings. But he gives a clue to what market research can do. Referring to product designs, Mr. Eggert says: "Our studies show that people want some changes in cars, but they don't want too many."

A conservative styling philosophy has been Ford's approach for several years. This year, it seems to be paying off in market penetration. Ford Div. alone is producing 25 per cent of the industry's cars compared with 23 per cent last year. General Motors' Chevrolet Div. has slipped from 31.8 per cent of total cars produced to 27.6 per cent. Chrysler Corp.'s Plymouth, whose first quarter output was held up by glass strikes, is down from 8.2 to 6 per cent.

Whether or not this customer acceptance will change could be debatable. There's little doubt that market research studies helped Ford make a profitable decision in 1957 when the 1959 models were planned. Confirms Henry Ford II, company president: "Our consumer research has been, and continues to be exhaustive; and it weighs heavily in our product planning." How Ford's market research is set up and some of its findings should be of interest to metalworking.

• **Aims**—"Our marketing research has three broad responsibilities. It's used for market forecasting, product planning, and communications that aid in selling cars," explains Mr. Eggert.

Each division has its own research staff which initiates studies in the three areas. Ford publishes a monthly confidential list of all projects so each division knows what the others are planning. "This allows free interchange of information and a free flow of results among the divisions," Mr. Eggert points out.

Examples of projects: Shopping studies on automobile salesmen's techniques; continuing surveys on how buyers like each year's models compared with competitive makes. From such programs, the company gets clues as to what people want now and more important, three years from now. "We first initiated a small car study back in 1954. I can't say I'm displeased with our conclusions today," comments Mr. Eggert.

Divisional report results are forwarded to Mr. Eggert's office. "Our job is to co-ordinate, summarize, and present the results to management in weekly meetings," he says. Some findings show what will affect the

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Use of Aluminum Products Per Car

(Pounds per average car)

	1959	1958	1957	1956	1955
Diecastings	21.3	19.1	18.6	15.7	12.3
Permanent Mold Castings	18.8	16.7	14.3	14.1	12.1
Sheets	9.4	8.4	5.0	2.4	1.7
Extrusions	1.4	1.5	1.6	0.2	0.3
Wire, Rods, Bars	0.4	0.5	0.4	0.2	0.1
Impact Extrusions	0.3	0.4	0.2	0.3	0.2
Others*	N/A	0.7	0.4	2.3	2.6
Totals	51.6	47.3	40.5	35.2	29.3

*Includes coatings, foil, powder, sand & plaster castings, forgings.
Source: Aluminum Co. of America. Figures do not include scrap, accessory, or replacement parts.

automotive market over the next ten or 15 years.

• **Market Forecasting**—Pointing to the figures on future car sales (Page 73), Mr. Eggert says over 70 per cent of the new cars sold each year are purchased by persons with annual incomes over $5000. Most of these are in the $5000 to $8000 bracket. Family formations and population increases are fairly predictable in determining how many buyers will be in that income group. But Mr. Eggert believes real disposable income is the most important factor in forecasting markets. He cites figures showing that disposable income has been rising 2 per cent per year. Department of Commerce statistics show the number of families with incomes over $8000 has been expanding a bit faster than other income groups, he adds.

What might keep disposable income from climbing as fast as anticipated? Mr. Eggert thinks the most important factor that affects this is scientific advances which increase productive efficiency. "Real income is a rough measure of productivity increases. Productivity can only be boosted through more efficient methods," he declares. He agrees that depreciation reforms are an important need in boosting productivity and keeping disposable income on the rise.

• **Product Planning**—In checking trends in product preference, the analyst treads on tricky ground. "We can measure what people like today, but it's tough to measure what they'll like three years from now; yet that's what counts in automotive planning," observes Mr. Eggert.

He says researchers still are trying to find out why tastes change. "We think we must find out what groups or what kinds of people are style leaders. We can't do it yet in the automobile business, but I think we're getting closer," he adds.

• **Communications**—Ford has been paying more attention to studies showing what kinds of advertising appeal most to customers and what product features should be plugged. An important factor is determining who makes the decision to buy a new car. It's believed that today's cars are styled for women. Mr. Eggert says many salesmen would be surprised to learn that men still dominate when it comes to making the final decision to buy, although the woman's voice has become more important.

Should your company get into market research? Of the $8 billion U. S. industry spends annually on research, Mr. Eggert says only $400 million goes into market research. Likening it to the art of weather forecasting, he points out that it's still an inexact science. It's relatively new, but analysts are learning more about it every day.

To be effective, market research must have the wholehearted approval of top management. "The market place still is the ultimate test of public acceptance for any product, but careful market research can reduce the risk. I believe it merits the careful consideration of any management group facing mass marketing problems," he asserts.

Small Cars Called Unsafe

Small cars potentially are more dangerous than larger ones, declares Prof. John O. Moore, director of automotive crash injury research at Cornell University. He claims that preliminary studies indicate lighter cars turn over twice as often as the heavier jobs, although they do seem to have better rollover protection.

"It seems that small cars have a completely different accident pattern than larger automobiles. The driver's personality or something in engineering design might be the explanations," asserts Professor Moore. He adds that many imported cars don't have enough structure ahead of the driver for protection in a crash.

U. S. Auto Output

Passenger Only

	1959	1958
January	545,757	489,515
February	478,484	392,112
March	576,085	357,049
April	578,825	316,503
4 Mo. Totals	2,179,151	1,555,179
May		349,474
June		337,355
July		321,053
August		180,324
September		130,426
October		261,696
November		514,099
December		593,920
Total		4,243,526

Week Ended	1959	1958
Apr. 11	133,202	84,997
Apr. 18	135,934	73,219
Apr. 25	133,987	58,664
May 2	118,059	78,434
May 9	136,600†	78,506
May 16	135,000*	87,407

Source: *Ward's Automotive Reports*. †Preliminary. *Estimated by STEEL.

How a leading automotive manufacturer Snyder-izes for the Soaring Sixties

HOLDS PISTON WEIGHTS ± 2 GRAMS AT 600 PER HOUR

This Snyder transfer machine automatically weighs die cast aluminum pistons and mills them to tolerances of ± 2 grams at double the rate of the previous method. Here's how it turns out 600 parts per hour:

Pistons are transferred bottoms-up to orienting station.

Pistons are oriented in relation to the wristpin hole offset.

Pistons are spun right side up (below at right) while they are advanced to weighing station.

Precise overweight is transmitted by memory system to weigh-mill station during transfer.

A 3¼" milling cutter removes excess with the piston clamped in position.

Gaging station re-weighs pistons to check weight. Deviation from part tolerances stops machine.

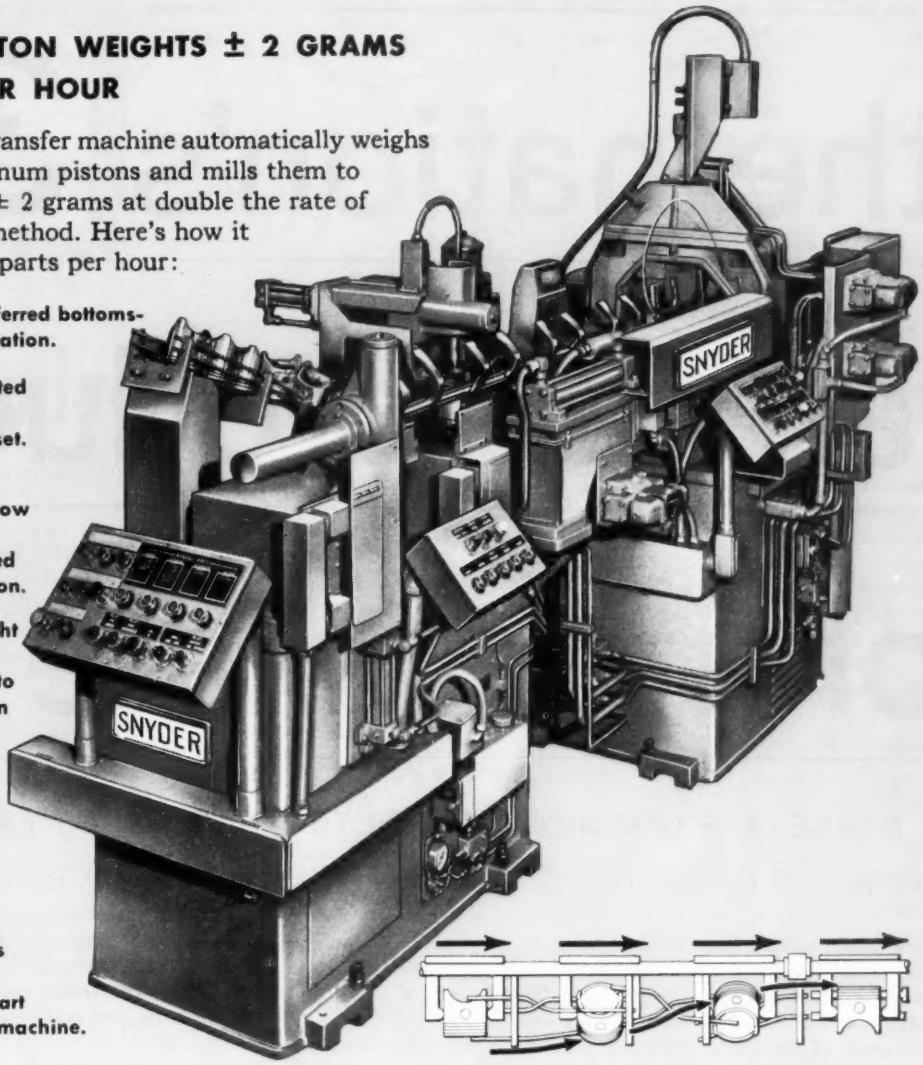

Diagram shows end over end rotation of piston as it passes through spiral rails.

Do your manufacturing cost problems revolve around parts handling, gaging and assembly as well as machining? Ask us to show you the benefits of SNYDER-IZING FOR THE SOARING SIXTIES. For a resume of SNYDER special machines engineered for profit opportunities, send for our new brochure or phone.

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PHASE "A" EXPANSION COMPLETED; NEW PLANT FACILITIES INCREASE CAPACITY, ESTABLISH A NEW HIGH IN PLATE QUALITY

Long the nation's leading specialist in steel plate, Lukens Steel Company is now geared to expanded volume production of its quality products. With Phase "A" completed, the company enters a new era in its nearly 150 years of service to industry. Lukens is now the country's third ranking steel plate producer. Major new facilities include:

A new, 100-ton-capacity electric furnace. With 12 existing open hearth furnaces, Lukens' annual capacity will be nearly one million ingot tons...

Twelve massive new ingot soaking pits, among the largest ever built, each capable of holding 200 tons. They're designed to heat record-size, 75-ton ingots to 2350 deg. F. for rolling into plate...

A new, 140-inch, 4-high automated slabbing mill to supplement other Lukens mills—which include the 206-inch giant that rolls the nation's widest and heaviest steel plate and the modern 120-inch mill. This new mill augments Lukens production of the widest range of plate sizes available anywhere.

What does this new expansion mean? First, its completion assures uninterrupted production of Lukens quality steels. Second, Lukens' customers can look forward to a growing supply of carbon and alloy steel plates, shapes, heads, weldments... renowned Lukens clad steels... Lukens "T-1" and "Nine Nickel" steels. And of utmost importance, Lukens is now better equipped than at any time in its long history to pursue the course that has done so much to bring about its continuing growth—*serving industry with steels that fit the job.*

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Lukens Steel Company, Coatesville, Pennsylvania.

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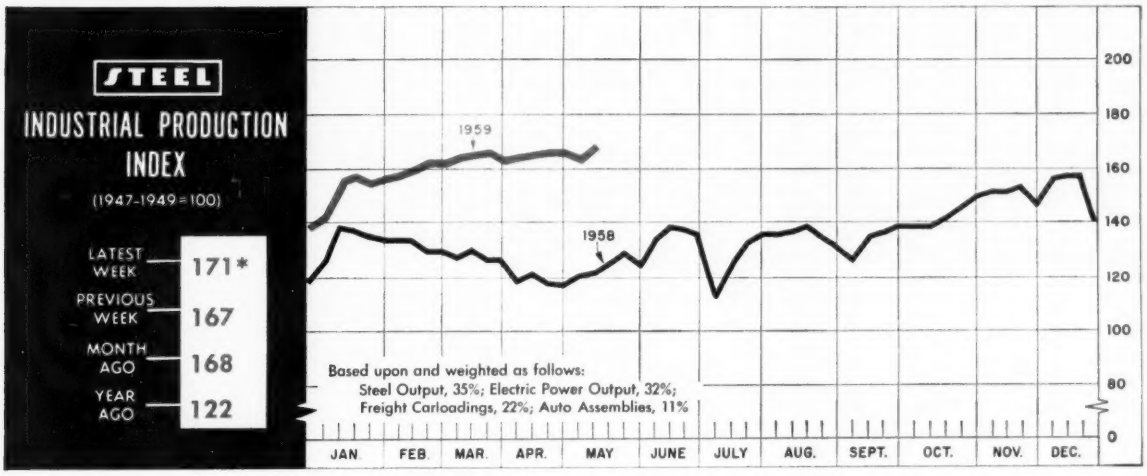

*Week ended May 9.

Production Tempo in Double Time

RECORD PERFORMANCE by all four elements in STEEL's industrial production index accounted for the largest week-to-week boost of the year, pushing the trend line to a preliminary high of 171 (1947-49=100). The figure topped the previous week's final tabulation by 4 points and shaded the previous record by 2 points.

How long the record can stand is a moot question. Auto producers are having no difficulty meeting their operating schedules, and railroaders see nothing but a continuation of the sharp uptrend of the last few weeks. But steel producers have failed to come up to anticipated levels for the last three weeks. Output of electricity has been fairly steady for the last four weeks, following the seasonal pattern.

Here is the picture at press time:

• **Steel Operations** — Steelmakers have been operating at about 94 per cent of capacity for two months, and their equipment is beginning to show it. During the week ended May 10, they had hoped to turn out a record 2,668,000 net tons for ingots and castings, says the American Iron & Steel Institute. (It was this estimate which figured in STEEL's preliminary production index above.) But they failed to make it, dropping to 2,604,000 tons, the lowest point since mid-March.

The fact that the industry is still about 6 percentage points shy of its theoretical capacity can be misleading. Those last few points represent old equipment which is costly to run and maintain. Also, some of the equipment which has made record output possible since early March is getting old and must be shut down occasionally for repairs. The downtime prevents mills from breaking the 95 per cent barrier.

Steelmakers have the business on the books to support higher activity, and they tried again last week to set a production record. The operating rate was scheduled for

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1,000 net tons)[2]	2,665[1]	2,604	1,412
Electric Power Distributed (million kw-hr)	12,600[1]	12,546	11,315
Bituminous Coal Output (1,000 tons)	8,270[1]	8,015	6,413
Crude Oil Production (daily avg—1,000 bbl)	7,130[1]	7,113	6,220
Construction Volume (*ENR*—millions)	$403.3	$410.9	$380.6
Auto, Truck Output, U. S., Canada (*Ward's*)	172,089[1]	154,719	105,188
TRADE			
Freight Carloadings (1,000 Cars)	680[1]	674	535
Business Failures (Dun & Bradstreet)	275	300	336
Currency in Circulation (millions)[3]	$31,369	$31,244	$30,659
Dept. Store Sales (changes from year ago)[3]	+8%	+4%	−8%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$26,103	$24,694	$24,456
Federal Gross Debt (billions)	$285.2	$285.6	$275.0
Bond Volume, NYSE (millions)	$31.9	$29.6	$24.2
Stocks Sales, NYSE (thousands of shares)	18,994	17,776	14,104
Loans and Investments (billions)[4]	$94.7	$94.9	$92.5
U. S. Govt. Obligations Held (billions)[4]	$29.3	$29.6	$30.5
PRICES			
STEEL's Finished Steel Price Index[5]	247.82	247.82	239.15
STEEL's Nonferrous Metal Price Index[6]	222.1	219.2	197.1
All Commodities[7]	119.6	119.8	119.3
Commodities Other than Farm & Foods[7]	128.0	128.0	125.4

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1959, 2,831,486; 1958, 2,699,173. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-39=100. [6]1936-39=100. [7]Bureau of Labor Statistics Index, 1947-49=100.

QUANTITY PRODUCTION OF GREY IRON CASTINGS

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THE WHELAND COMPANY
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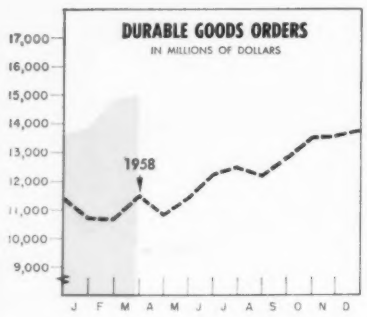
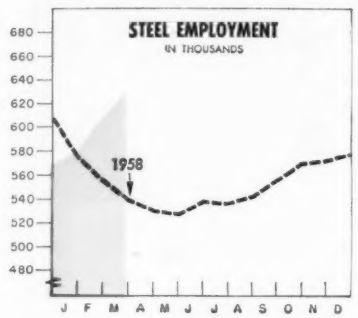
THE BUSINESS TREND





	New Orders* 1959	New Orders* 1958	Sales* 1959	Sales* 1958
Jan.	13,900	10,704	13,541	12,646
Feb.	14,900†	10,688	13,900†	12,038
Mar.	15,100†	11,488	14,300†	11,670
Apr.	.....	10,833	.....	11,532
May	.....	11,423	.....	11,643
June	.....	12,245	.....	12,086
July	.....	12,512	.....	12,256
Aug.	.....	12,177	.....	12,385
Sept.	.....	12,859	.....	12,723
Oct.	.....	13,530	.....	12,943
Nov.	.....	13,574	.....	13,295
Dec.	.....	13,673	.....	13,613

*Seasonally adjusted. †Preliminary.
U. S. Office of Business Economics.
Charts copyright, 1959, STEEL.

	Employment in Thousands 1959	Employment in Thousands 1958	Payroll in Millions 1959	Payroll in Millions 1958
Jan.	584	575	$348.0	$297.4
Feb.	607	554	346.8	261.7
Mar.	631	539	400.2	271.8
Apr.	...	529	....	259.1
May	...	527	....	270.1
June	...	538	....	278.6
July	...	536	....	280.1
Aug.	...	542	....	299.1
Sept.	...	555	....	308.1
Oct.	...	569	....	341.7
Nov.	...	571	....	320.7
Dec.	...	577	....	340.7

American Iron & Steel Institute.

95 per cent of capacity, good for 2,690,000 net tons.

• **Auto Production**—After taking a week off for inventory adjustments, General Motors Corp. reactivated its B-O-P plants. This was a big factor in raising auto-truck output to 163,766 units during the week ended May 9. It was the highest mark of the year and the best weekly effort since early December.

Sales have sparked industry efforts reminiscent of the plush 1955 era. April retail sales (503,900 units) were the highest in 22 months. Since January, sales have climbed each month—it's the first time this has happened in four years, declares *Ward's Automotive Reports*. New car inventories have risen to 897,000 units, or nearly 90,000 higher than they were on May 1, 1958. But at today's higher selling rate, it's only a 46 day supply, not considered excessive.

Output should remain strong throughout May and into June, with occasional fluctuations reflecting inventory adjustments similar to GM's. No real slowdown will come until automakers start preparing for model changeovers.

• **Carloadings**—Here is one of the most significant indicators of the strength of today's business. During the week ended May 2, the nation's railroads loaded 674,123 cars of revenue freight, the best mark so far in 1959. The two big factors in the continued uptrend: Miscellaneous freight and iron ore.

Most of metalworking's shipments come under the general heading of miscellaneous freight, and it is this category which shows the biggest jump over corresponding 1958 figures. In the latest period, it was up 67,046 cars. Week-to-week gains have been running as much as 10,000 or 12,000 cars.

Demand for steel is reflected in the rapid buildup of ore shipments from upper lakes ports. Carloadings jumped over 12,000 cars in the latest week, and the trend will continue until early summer.

• **Electricity Output**—The nation's powerhouses are generating close to 12.6 billion kw-hr a week, which is a record for this time of year but well beneath the peak performance of the industry in late fall and midsummer. Usually, mid-May marks the beginning of this important industry's upturn, which could be more marked this year because of the strength of general business.

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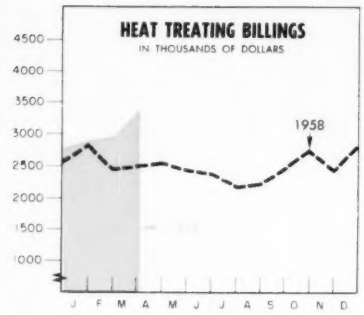

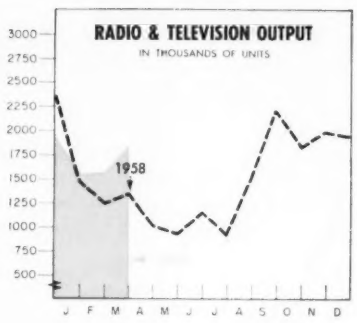

	1959	1958	1957
Jan.	2,915.5	2,825.5	3,533.9
Feb.	2,976.0	2,466.3	3,378.9
Mar.	3,397.3	2,490.5	3,631.8
Apr.	.....	2,542.6	3,572.4
May	.....	2,421.5	3,389.6
June	.....	2,374.8	2,912.1
July	.....	2,139.6	2,767.5
Aug.	.....	2,213.0	2,830.8
Sept.	.....	2,457.1	2,765.0
Oct.	.....	2,744.9	3,076.2
Nov.	.....	2,422.0	2,677.2
Dec.	.....	2,799.4	2,579.3

Metal Treating Institute.

	Radio		Television	
	1959	1958	1959	1958
Jan.	1,125	1,026	437	434
Feb.	1,125	877	459	370
Mar.	1,348	931	494	417
Apr.	....	697	...	303
May	....	655	...	267
June	....	774	...	377
July	....	622	...	275
Aug.	....	1,029	...	507
Sept.	....	1,572	...	622
Oct.	....	1,322	...	496
Nov.	....	1,546	...	438
Dec.	....	1,526	...	415
Totals	....	12,577	...	4,921

Electronic Industries Association.

PAs Note Crescendo

The National Association of Purchasing Agents terms the business pickup as "almost dramatic" in its latest survey of its members. Fifty-six per cent of the respondents reported better business in April than in March, which is the highest "up" percentage since early 1955. And from the looks of new orders (53 per cent said they were higher in April), there will be no dropoff in the immediate future.

One indication is the bright outlook for labor among respondents. Thirty-eight per cent declared they expect to have higher payrolls in the second quarter than in the first.

Employment Score Rises

Latest report from the Labor and Commerce Departments shows that the rise in payrolls is already here. In mid-April, employment reached 65 million persons, the highest on record for that period. The figure compares with 63.2 million in March and is about twice the rate of rise normal for April.

The unemployment situation also improved about twice as much as it normally does between March and April. The number fell 735,000 to 3,627,000, the lowest total since December, 1957. Seymour Wolfbein, Labor's manpower chief, claims that if only seasonal changes take place between now and October, the jobless total will be down to 2,876,000 by then. But he expects better than seasonal improvement, which could result in the best unemployment picture since 1956.

Appliance Sales Pitch Up

Appliance sales continue to reflect the marked upturn in consumer ability and desire to buy hard goods. Norge Div. of Borg-Warner Corp. reports April factory sales of its home appliances were the best for that month in the company's 32-year history. Says Judson S. Sayre, president: "Volume was 47 per cent more than the same month in the Norge record year of 1955. No doubt about it, home appliances are getting a bigger share of the consumers' spending dollar."

The National Electrical Manufacturers Association reports that industry sales of electric refrigerators in March were 333,700 units, the highest since July, 1956. Sales of electric ranges also hit a three year high.

In a recent nation wide survey of honeycomb section manufacturers by an independent research organization, 75% of the responders indicated that uniform thickness of the thin metal core material was the most important factor demanded of suppliers.

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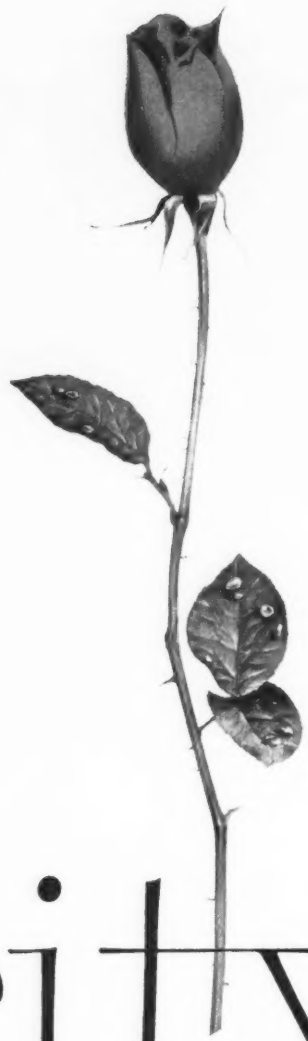

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U. S. Steel eng.-research

E. T. WALTON
Crucible dir.-metallurgy

Arthur E. Gilman was elected president of **Bay State Abrasive Products Co.**, Westboro, Mass. He continues as treasurer.

Thomas Evans was elected chairman and chief executive officer of **Crane Co.**, Chicago. Mr. Evans is chairman of H. K. Porter Company Inc., Pittsburgh. **L. H. T. Clegg**, for many years president of Crane's Canadian subsidiary, had been named president of the parent company to fill the vacancy created by resignation of **Neele E. Stearns**. It is indicated that Mr. Clegg will serve as interim administrative officer until a permanent replacement is named.

Harvey L. Spaunburg Jr. was appointed vice president-manufacturing, **Hartford Special Machinery Co.**, Hartford, Conn. **Robert A. Bode** was made vice president-sales; **Francis A. Carr**, factory manager. Mr. Spaunburg was manager of manufacturing for the division.

Stephen M. Jenks was appointed executive vice president-engineering and research, **United States Steel Corp.**, Pittsburgh. He succeeds **Walter F. Munford**, new president and chief administrative officer of U. S. Steel. Mr. Jenks was named assistant executive vice president-operations in 1953, and became in 1958 administrative vice president-central operations (steel and coal).

Kendall C. White succeeds **Emil F. Gibian** as director of industrial engineering, **Thompson Ramo Wooldridge Inc.**, Cleveland. Mr. White, now serving as manager, industrial engineering and purchasing, for the Tapco Group, assumes his new post June 1 when Mr. Gibian retires.

Louis H. Schuette was made administrative vice president for all operations of **Sundstrand Corp.**, Rockford, Ill. **A. H. Swenson** was promoted from manager to vice president, Hydraulic Div. Both are newly created positions.

E. T. Walton was made director of metallurgy, **Crucible Steel Co. of America**, Pittsburgh. He succeeds **D. I. Dilworth**, resigned. Mr. Walton continues as manager-customer technical services.

Robert H. Davies was elected president, **Electric Auto-Lite Co.**, Toledo, Ohio. He succeeds **James P. Falvey**, now chairman. Mr. Davies was vice president with Clark Equipment Co. **Gurdon W. Wattles**, former chairman, was named chairman of the executive committee, replacing **C. Russell Feldmann**.

Donald T. Wynne Jr. was named division manager-plastic operations, **Vlchek Tool Co.**, Cleveland.

Harry H. Whittingham was appointed president and general manager, **Long Mfg. Div.**, Detroit, Borg-Warner Corp. He was executive vice president and assistant general manager, a position he assumed in 1957 when Detroit Gear Div. was consolidated with Long Mfg. He

HARVEY L. SPAUNBURG JR.

ROBERT A. BODE
Hartford Special Machinery vice presidents

LOUIS H. SCHUETTE

A. H. SWENSON
Sundstrand executive positions

RICHARD M. FURLAUD
Olin Mathieson v. p.

ROBERT E. ROOT
Rheem division manager

AL THURMAN
heads Lombard operations

JOSEPH J. ROSECKY
Clark Bros. exec. v. p.

is also chairman of Long's two Canadian subsidiaries.

Richard M. Furlaud, general counsel of **Olin Mathieson Chemical Corp.**, New York, was appointed a corporate vice president. **Richard Bryce** was named treasurer to succeed **Earl R. Van Vliet**, retired.

Robert E. Root was appointed manager, Electro-Mechanical Div., Los Angeles, **American Electronics Inc.** He is responsible for the division's manufacturing facilities in East Los Angeles, as well as those under construction in Fullerton, Calif.

Charles S. Shepherd was appointed director of purchases, **American Bridge Div.**, Ambridge, Pa., U. S. Steel Corp. He succeeds **William H. Walter**, retired. Mr. Shepherd was assistant purchasing director.

William K. Meyers, executive vice president, was elected president of **Bassick Co.**, Bridgeport, Conn., subsidiary of Stewart-Warner Corp.

Al Thurman was named president of **Lombard Mfg. Co.**, and vice president of **Lombard Corp.** His headquarters are in Youngstown. Prior to joining Lombard, he served as a management consultant and consulting engineer to heavy industry from his office in Huntington, W. Va., which he will maintain.

Edward W. Lothman was elected senior vice president; **Richard W. Nuffort**, vice president and treasurer of **Whitehead Metals Inc.**, New York, an affiliate of International Nickel Co. Inc. **Casimir J. Bianowicz** was made general sales manager for all products of Inco's Huntington Alloy Products Div., and was elected assistant vice president of Whitehead.

John C. Redmond, former vice president-metallurgical research and development for Kennametal Inc., joins **Firth-Sterling Inc.**, Pittsburgh, on June 1 as director of research. He will succeed **David F. Dickey**, who is resigning as of that date.

Joseph J. Rosecky was appointed executive vice president, **Clark Bros. Co.**, Olean, N. Y., Dresser Industries. He joined Clark in 1957 as vice president-operations. He succeeds **F. W. Laverty**, recently named president.

Robert L. Reese was promoted to manager, product development, **Hubbard & Co.**, Chicago. He is succeeded by **Andrew C. Verock** as chief engineer, pole line hardware, operating out of the new Hubbard research laboratory in McCook, Ill. Mr. Verock was with Commonwealth Associates Inc.

Joseph L. Mullin retired as executive vice president, **American Manganese Steel Div.**, American Brake Shoe Co., New York.

Frank Randall was elected vice president, **North American Philips Co. Inc.**, New York. He continues as president of Amperex Electronic Corp., New York, and as vice president of Ferroxcube Corp. of Amer-

CHARLES S. SHEPHERD
American Bridge dir.-purchases

WILLIAM K. MEYERS
Bassick president

JOHN C. REDMOND
joins Firth-Sterling

FRANK RANDALL
North American Philips v.p.

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White Motor-Reo post

STANLEY L. ALBRIGHT
Hunter Spring plant mgr.

L. C. LADERER
Wells Aluminum exec. v.p.

ROBERT H. HOAGLAND
Claud S. Gordon v. p.

ica, Saugerties, N. Y., affiliate companies.

Stanley **L. Albright** was made manager, Plant No. 2, **Hunter Spring Co.**, Lansdale, Pa., division of American Machine & Metals Inc. He is in charge of manufacturing. He previously represented Hunter as a sales engineer in the New York area.

L. C. Laderer was appointed executive vice president, **Wells Aluminum Corp.**, North Liberty, Ind. He was vice president and director of sales.

William Zatezalo was made open hearth superintendent, **Weirton Steel Co.**, Weirton, W. Va., division of National Steel Corp. He succeeds **J. R. Rath**, retired.

Walter G. Mitchell was elected executive vice president of the newly formed Western Div., Torrance, Calif., of **R. C. Mahon Co. D. L. Buttrey** was elected vice president-manufacturing; **Walter E. Willard**, vice president-Structural Steel Div.

Robert H. Hoagland was elected vice president and general manager, **Claud S. Gordon Co.**, Chicago, subsidiary of Cleveland Pneumatic Industries Inc. For the last five years, Mr. Hoagland served as vice president of Aerovox Corp., New Bedford, Mass.

Kenneth F. Echard was made sales manger; **Roman F. Beck**, blast furnace superintendent, **Tonawanda Iron Div.**, Tonawanda, N. Y., American Radiator & Standard Sanitary Corp. Mr. Echard succeeds **Frank P. Breier**, retired for reasons of health. Mr. Beck succeeds **Albert D. Bright**, recently made division manager of operations.

William E. McQuillen was named manager of market research, **Exide Industrial Div.**, Electric Storage Battery Co., Philadelphia. Former process engineering supervisor at the Stokes Molded Products Div., Trenton, N. J., he succeeds **Thomas Peacock**, recently named Exide's marketing manager. **O. L. Robertson** was named Exide's motive power market manager.

Mallory-Sharon Metals Corp., Niles, Ohio, formed a Sponsored Research Group, and named **Dr. Dillon Evers** manager of the new department. It will carry out research and development projects on special metals for the government. The group will be a part of Mallory-Sharon Metals' R&D group. **L. G. McCoy** is staff administrator. Dr. Evers joined Mallory-Sharon in 1956, and has been staff technical advisor to the company's research and development department.

Charles E. Patterson Jr. was elected president, **Chambers Porcelain Buildings Inc.**, Chicago, subsidiary of Chambers Mfg. Corp. He was with Vitreous Corp. as manager of engineering and construction.

John C. Tooker, former general manager of **White Motor Co.'s** Reo Div., Lansing, Mich., was named a vice president of White Motor, and general manager of the Reo Div. **Noah O. Gresham,** director-wholesale operations at White, was appointed vice president-wholesale operations, White Truck Div., Cleveland.

John G. Martin was named domestic sales manager, Boiler Div., Barberton, Ohio, **Babcock & Wilcox Co.** He is succeeded by **William E. Butler** as manager of the Cincinnati district sales office.

Edwin J. DuBane was made sales manager, **Borroughs Mfg. Co.**, Kalamazoo, Mich., subsidiary of American Metal Products Co.

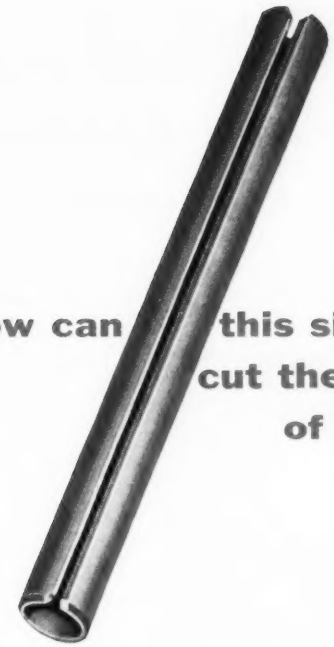
Herbert S. Lindahl was promoted to chief product engineer-refrigeration, **Betz Div.**, Danville, Ill., Bohn Aluminum & Brass Corp. **Gordon Kayser** was promoted to chief product engineer-heating and air conditioning.

OBITUARIES...

J. Lewis Small, 85, founder and president, **J. Lewis Small Co. Inc.**, Elwood, Ind., died May 4.

Myron C. Taylor, 85, former chairman, **U. S. Steel Corp.**, died May 6 in New York.

Byron F. Bower, 63, founder of **Pines Engineering Co. Inc.**, Aurora, Ill., died May 5. He served as president.



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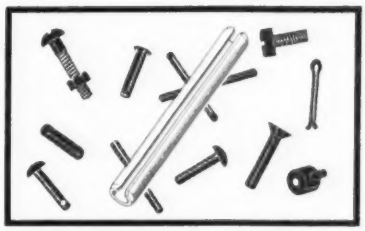
Rollpin aids standardization and reduces inventory

Rollpin readily replaces taper pins, grooved pins, straight pins and set screws; it can be used as a locating dowel, hinge pin, cotter pin, stop pin or, in some applications, even as a rivet. Thus, when you standardize on a Rollpin you can drastically reduce the variety of fasteners in your inventory—save money in purchasing, storage space and stock handling.



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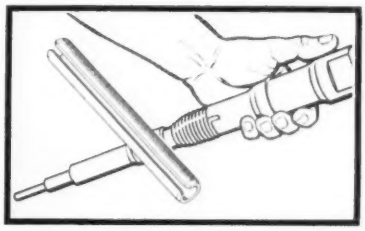

Rollpin simplifies product maintenance

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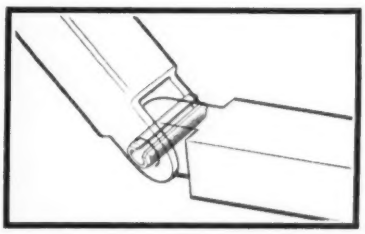

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a product of

Elastic Stop Nut Corporation of America

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Please send the following free fastening information

- ☐ Rollpin bulletin
- ☐ ELASTIC STOP® nut bulletin
- ☐ Here is a sketch of a fastening problem. What ESNA® fastener would you recommend?

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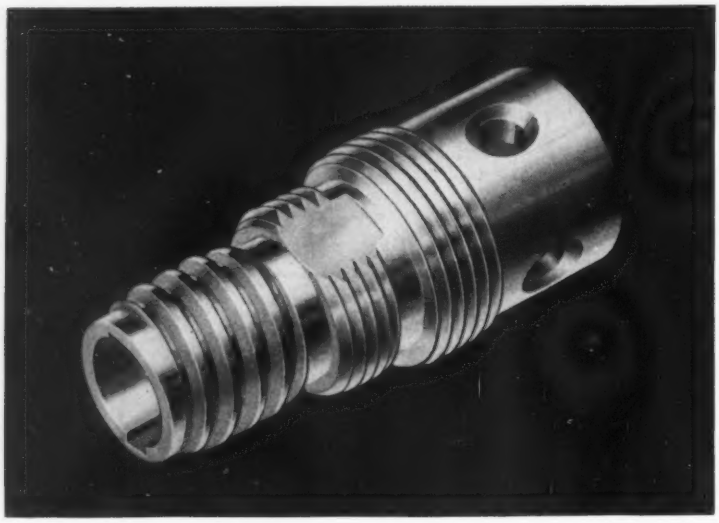
Title_____

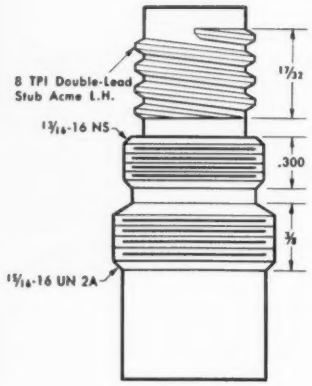
Firm_____

Street_____

City_____ Zone____ State_____

COST CUTTING on tough jobs—like rolling a double-lead Stub Acme thread—may be easier than you think. Olson Mfg. Co. needed only a minor adjustment in a standard Anaconda rod

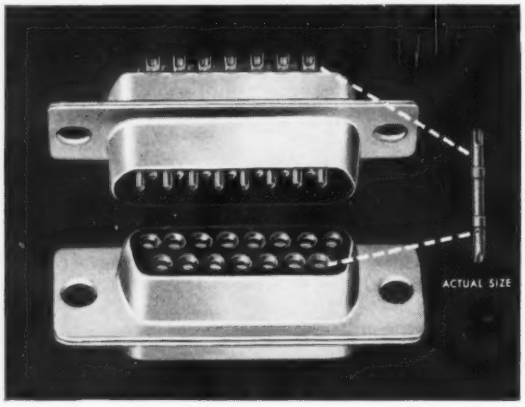




Rolling three threads *(drawing, right)* in two positions on a 6-spindle automatic meant cost savings for Olson Mfg. Co., Worcester, Mass. The Acme thread, however, posed problems. American Brass specialists suggested minor modification of standard Anaconda Free-Cutting Brass Rod to provide the extra ductility needed. The idea worked and the resulting valve spindle is shown above, about 1½ times actual size.

—or maybe you need a different alloy rod. The tiny connectors, right, have to be machined from .078" rod, requiring many precision form-cutting, drilling, slotting operations. So machinability is a vital property of the rod used—but so are adequate electrical conductivity, high strength, and fatigue resistance.

Cannon Electric, Los Angeles, makers of these electrical plug assemblies, had to find a rod with a delicately balanced combination of mechanical properties to provide the unfailing and continuous performance required. They found it in Anaconda Free-Cutting Phosphor Bronze-610 Rod, developed by American Brass metallurgists to combine the strength, resilience, fatigue resistance of phosphor bronze, and machinability approaching that of free-cutting brass.



MEETING the joint requirements of designers, manufacturing men, and buyers—to achieve high quality and performance while simplifying fabrication and cutting over-all costs—is an important function of American Brass technical specialists. For imaginative and practical help of this kind, see your American Brass Company representative or write: The American Brass Company, Waterbury 20, Conn. In Canada: Anaconda American Brass Ltd., New Toronto, Ont. 6099

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COPPER · BRASS · BRONZE
NICKEL SILVER · MILL PRODUCTS
Made by The American Brass Company

Canada Gets Big Pipe Mill

Page-Hersey Tubes and Steel Co. of Canada will produce steel pipe up to 42 in. OD in $10 million facility to be built in Edmonton, Alta. Could operate in six months

A PIPE MILL with an annual capacity of about 325,000 tons will be built at Edmonton, Alta. It is a joint venture of Page-Hersey Tubes Ltd., Toronto, Ont., and Steel Co. of Canada Ltd., Hamilton, Ont. The mill (estimated cost: $10 million) will be operated by a separate company incorporated under Alberta laws.

It will produce steel pipe from 16 in. to 42 in. OD. It will be the first mill in Canada and the second known in the world to make steel pipe larger than 36 in. in diameter in continuous welded 40-ft lengths, say officials of the companies.

• **Fast Construction**—W. E. Bannerman, president of Page-Hersey, says that "if required, the new plant can be in partial production in six months, and in any event will be in full production in 12 months." He added that the decision to locate in Edmonton was the result of discussions with members of the oil and gas industries having regard to future pipe-laying areas.

"The decision was also influenced by discussions with the railways, with respect to freight haulage and freight rates, both important factors in a heavy industry such as this," he says.

• **Cold-Expanding Process** — Page-Hersey and Stelco have been making steel pipe from 20 in. to 36 in. OD for the last two years at the jointly owned Welland Tubes Ltd. at Welland, Ont. A specialized, cold expanding process is used.

"The cold expansion at our Edmonton plant," Mr. Bannerman says, "will be carried out on a $1 million machine." Page-Hersey was the first company to use the process in the production of roll-formed pipe, and to date remains the only firm in Canada equipped to use it, although it has been adopted by almost every other main pipe producer throughout the world, he states.

The 325,000 ton pipe production capacity of the Edmonton mill and the 300,000 ton capacity of the Welland "Big-Inch" mill will ensure that the large diameter pipe needs of Canada are fully met, he said.

Firms Change Names

Phoenix Steel Corp. is the new name of Barium Steel Corp., New York. Negotiations for construction of an oxygen steelmaking plant at Burlington, N. J., have narrowed down to three groups of American, British, and German suppliers, says J. A. Sisto, chairman. A turn-key contract for construction of the plant will likely be signed within 90 days.

Sundstrand Machine Tool Co. changed its name to Sundstrand Corp. The company is building an addition to its Belvidere, Ill., machine tool manufacturing plant.

Crucible to Build Mill

Crucible Steel Co. of America, Pittsburgh, is negotiating new financing which will provide funds for the purchase and installation of a multiple stand, continuous, hot strip mill at its Midland (Pa.) Works. Estimated cost: $23 million.

"The purpose of the program," says Joel Hunter, president, "is to effect substantial economies in the production of flat rolled products, especially stainless steels, to improve quality, and to provide capacity needed for further expansion of the company's flat rolled products."

Universal-Cyclops Expands

Universal-Cyclops Steel Corp., Bridgeville, Pa., has purchased the land and buildings of Flannery Mfg. Co., that city. The sale involves none of the manufacturing facilities or equipment. Universal-Cyclops will use the property for the warehousing of finished steel and the consolidation of its Bridgeville plant offices.

Forms Smith-Erie Div.

A. O. Smith Corp., Milwaukee, has formed the Smith-Erie Div. through consolidation of Erie Meter Systems Inc., Meter Div., and Service Station Pump Div. H. D. Leisenring is general manager of the consolidated division; J. S. Thompson, assistant sales manager; J. W. Harris, sales manager, engineered products; C. P. Hammill, sales promotion manager; L. G. Blumenberg, service manager; and R. L. Dull, assistant service manager.

Kaiser Gets Mill Contract

Kaiser Steel Corp.'s Fabricating Div. will manufacture at its Napa, Calif., plant the major equipment for Japan Steel & Tubes Co.'s large diameter pipe mill. The mill will be built near Tokyo to turn out pipe from 18 in. through 40 in. in diameter. The $2.5 million Kaiser contract covers a pipe forming line, welding equipment, a hydraulic expander, and related finishing equipment.

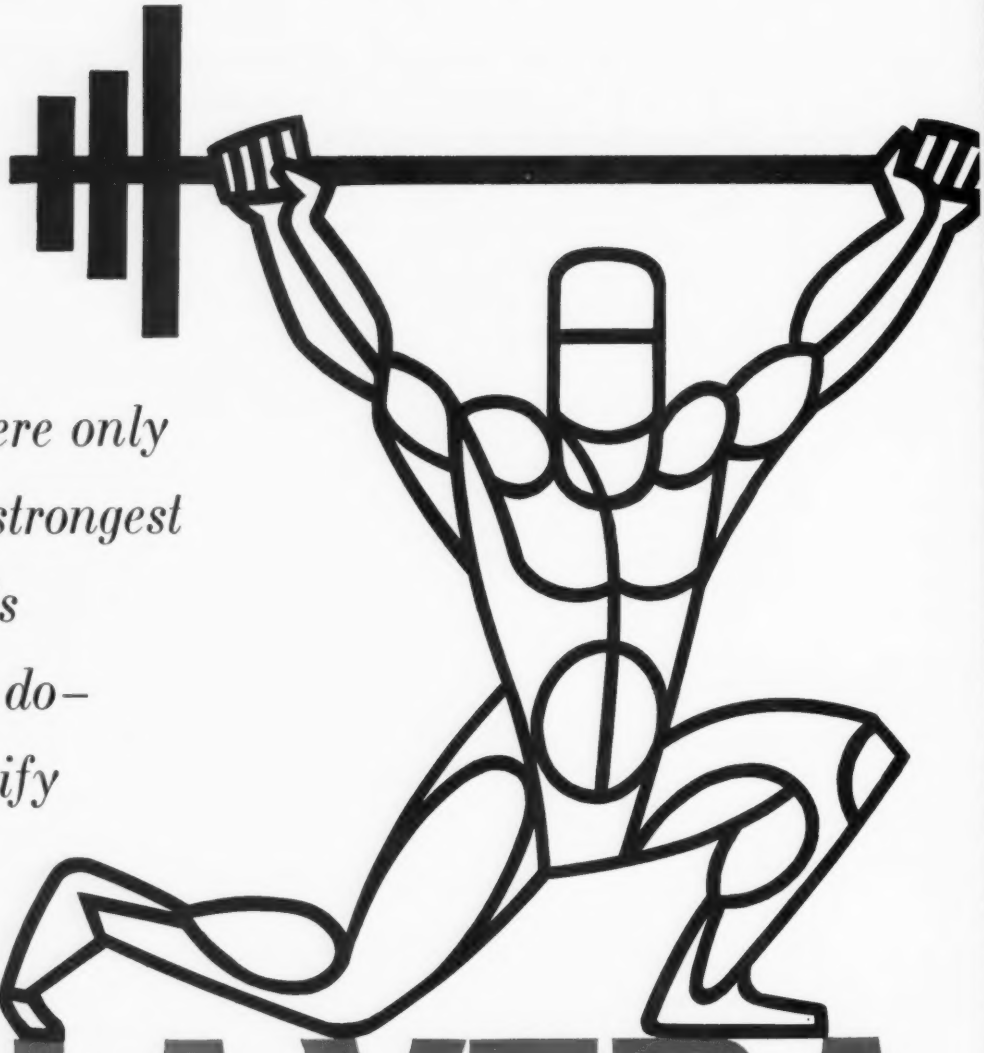
Porter Builds in Virginia

H. K. Porter Company Inc., Pittsburgh, will lease a $1.2 million plant to be built at Danville, Va., for its Disston Div., Philadelphia. Construction is expected to be completed early in September. Output of the 155,000 sq ft structure will include industrial saws, power and garden tools, and other hardware items.

Eaton Heads New Unit

Hamilton Standard, a division of United Aircraft Corp., Windsor Locks, Conn., created a new department for the design, development, and manufacture of specialized ground support equipment for missiles and aircraft. The department is headed by Edwin D. Eaton. He will be assisted by R. P. Lambeck, chief of preliminary design and sales; W. M. Alford, development engineer; Harold Rourke, chief of ground support equipment

(*Please turn to Page* 90)



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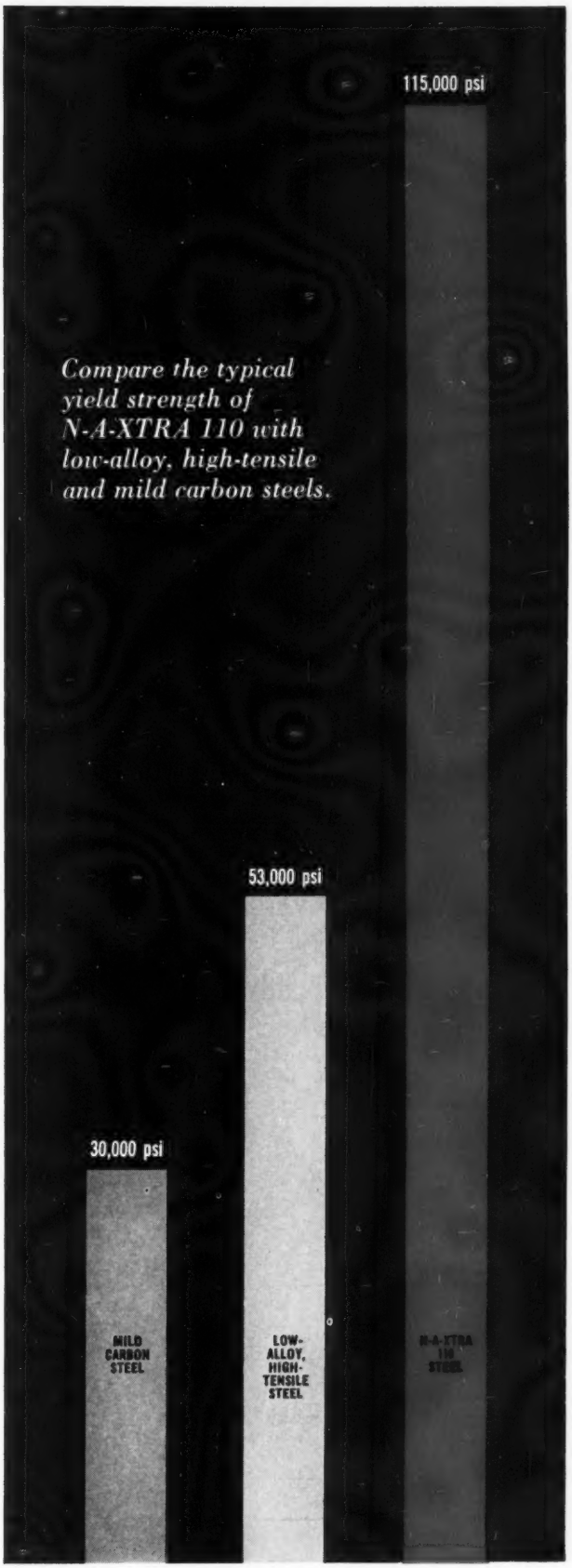
115,000 psi
Compare the typical yield strength of N-A-XTRA 110 with low-alloy, high-tensile and mild carbon steels.
53,000 psi
30,000 psi
MILD CARBON STEEL
LOW-ALLOY, HIGH-TENSILE STEEL
N-A-XTRA 110 STEEL

Now available, N-A-XTRA HIGH-STRENGTH is a low-alloy heat-treated steel, fully quenched and tempered. The minimum yield strength range of N-A-XTRA steel is from 80,000 to 110,000 psi.

The great strength of N-A-XTRA (nearly three times that of mild carbon steels) gives designers the opportunity to eliminate costly dead weight from your products.

N-A-XTRA is tough at normal and subnormal temperatures. It can be readily cold formed into difficult shapes. And it welds beautifully by any process—with no underbead cracking. For a job where only the strongest of steels will do . . . specify N-A-XTRA HIGH-STRENGTH steel.

Write today for your copy of new illustrated technical brochure. Address Great Lakes Steel Corporation, Detroit 29, Michigan, Dept. B-6.

GREAT LAKES STEEL

A DIVISION OF NATIONAL STEEL CORPORATION

(*Concluded from Page 87*)

production; and S. V. Martin, administrative assistant. Vernon E. Hupp is chief of experimental operations; J. W. Meier, head of hydraulic pump development work.

GM Merges Two Divisions

General Motors Corp., Detroit, consolidated its Central Foundry and Fabricast divisions. Fabricast is part of Central Foundry Div. and its plants in Bedford, Ind., and Jones Mills, Ark., are designated as the Fabricast plants of Central Foundry Div. James H. Smith is general manager of Central Foundry; G. A. Zink, manger of the Fabricast plants.

Leece-Neville Diversifies

Leece-Neville Co., Cleveland, has diversified its product line through acquisition of A. C. Motor Div. of O. A. Sutton Co., Wichita, Kans. It marks the company's first move into the alternating current motor field. Range of the new motors is 1/150 to ¼ horsepower.

Ohio Ferro-Alloys Expands

The last of three large electric furnaces has been turned on at Ohio Ferro-Alloys Corp.'s plant at Powhatan Point, Ohio. Major products of the plant are silicon metal and silicon alloys.

Robertshaw-Fulton Builds

Robertshaw-Fulton Controls Co., Richmond, Va., is building a $4 million plant at New Stanton, Pa., which will increase production capacity of its Robertshaw Thermostat Div. by 50 per cent. It will consist of two manufacturing buildings with 265,000 sq ft of floor space and an office building with 62,000 sq ft. When completed in mid-1960, it will replace plants at Youngwood and Scottdale, Pa.

Ferroalloy Plant Enlarged

Pittsburgh Metallurgical Co. Inc., Niagara Falls, N. Y., is installing another furnace at its Calvert City, Ky., plant. The company produces ferroalloys and expects to start operation of the new facility in the last quarter of this year.

To Build Oxygen Plant

Air Products Inc., Allentown, Pa., will build a $6 million plant at Glassmere, Pa., to produce liquid oxygen, nitrogen, and argon. Initial operation is scheduled for this fall.

CONSOLIDATIONS

Koppers Co. Inc., Pittsburgh, purchased **George W. Swift Jr. Inc.**, Bordentown, N. J., maker of special machinery for the paper-box industry. The Bordentown plant is assigned to Koppers' Metal Products Div., Baltimore.

Magnethermic Corp., Youngstown, has taken over ownership and operation of **Ajax Engineering Corp.** and **Ajax Electrothermic Corp.**, Trenton, N. J. The organization has been renamed Ajax Magnethermic Corp. Ajax Engineering makes low frequency induction melting equipment; Ajax Electrothermic, high frequency induction melting equipment.

Ducomunn Metals & Supply Co., Los Angeles, acquired **Barde Steel Co.**, Seattle, a service center for hot rolled carbon steel, cold finished bars, cold rolled and galvanized sheets.

H. D. Conkey & Co., Mendota, Ill., purchased **Spartan Tool Co.**, Chicago, manufacturer of power driven drain and sewer line cleaning machines, sewer cable, and cutting tools.

Baird-Atomic Inc., Cambridge, Mass., purchased four companies: **Atomic Associates Inc. of New York, Atomic Associates Inc. of** California, Atomic Accessories Inc., and **Atomic Development & Machine Corp.** Baird-Atomic makes electronic and atomic instrumentation, spectrographic equipment, and military infrared systems.

Artloom Industries Inc., New York, acquired **City Iron Works Inc.** and its subsidiaires, **City Iron Works Erection Co.** and **City Bridge & Steel Works Inc.**, all of Hartford, Conn. City Iron and its affiliates are fabricators and erectors of structural steel for bridges and buildings.

Alliance Ware Inc., Alliance, Ohio, purchased **Crown Sanitary Pottery Inc.**, Evansville, Ind. Alliance Ware, a subsidiary of American Metal Products Co., Detroit, produces porcelain-on-steel plumbing ware, while Crown Sanitary produces companion products.

Airtek Dynamics Inc., Los Angeles, acquired **Research Welding & Engineering Co. Inc.**, Compton, Calif. John A. Toland, founder of RW&E, becomes vice president of both firms.

Riverside Plastics Corp., Hicksville, N. Y. purchased **Bischoff Chemical Corp.**, Ivoryton, Conn., maker of stripable plastic coatings used for protecting metal cutting tools and metal parts during shipment and storage and as a stop-off in plating.

Fuller Co., Catasauqua, Pa., purchased **Traylor Engineering & Mfg. Co.**, Allentown, Pa., a subsidiary of General American Transportation Corp., Chicago. Traylor designs and makes mining, smelting, cement and other rock products processing machinery.

Northrop Corp., Beverly Hills, Calif., acquired **Page Communications Engineers Inc.**, Washington.

NEW ADDRESSES

Youngstown Steel Products Co. (representing Youngstown Sheet & Tube Co., Youngstown) moved its district sales office to 706 Second Ave. S., Minneapolis 2, Minn.

Hubbard & Co., Chicago, moved its New York sales office to 790 Broad St., Newark 2, N. J. The Unit Rail Anchor Div. and Tool Div. are also involved in the move.

Benjamin Metals Co. will move its Los Angeles warehouse and general office to 1829 W. El Segundo Blvd., Compton, Calif. The firm stocks steel, aluminum, brass, and copper products.

National Cylinder Gas Div.,

DELAY
POWER OFF
FINE GAIN
RANGE
BRANSON INSTRUMENTS, INC.
BROWN HOUSE ROAD • STAMFORD • CONNECTICUT
this photograph is slightly enlarged
sensitivity ● full-scale deflection for #1 Alcoa Test Bloc
(1/64" flat-bottom hole) at 2.25 and 5.0 m
resolution ● in contact testing, 3/64" flat-bottom hole
1/8" below the surface at 2.25 mc.
markers ● pyramid type, adjustable for length an delay
frequency ● infinite choice, as determined by tra sducer,
between 0.4 mc and 10.0 mc.
flaw alarm ● optional plug-in.
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FLAW DETECTOR
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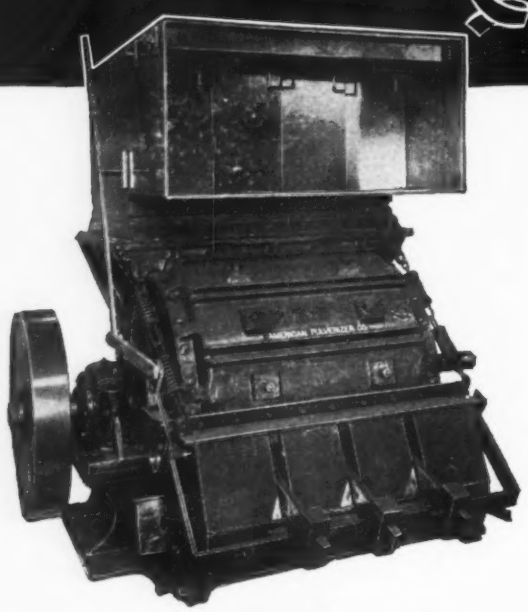
Here's A Curly Cue To New Market Value For Your Machine Turnings



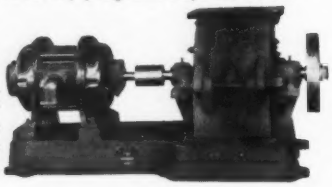
American METAL TURNINGS Crusher

That single machine turning of curled-up steel shown above can be mighty troublesome and costly to your operations.

Gnarled up with thousands of others like itself, it becomes a problem in space . . . gallons of re-usable cutting oil are trapped in the folds . . . and the scrap value is greatly minimized.

Answer? Run this tangled waste through an efficient, AMERICAN METAL TURNINGS CRUSHER. Out come sized ships that are easy to handle for shoveling or pneumatic handling . . . easy to store (savings in space up to 75%) . . . easy to spin for oil recovery . . . and crushed turnings command a higher price.

The cost is easy, too, on your scrap recovery program. Pays for itself.



RECLAIM FUSED WELDING FLUX
American Hammermill reduces fused flux to fine regranulation for perfect re-use. Why throw away profits! Details on request.

"Write for Metal Turnings Bulletin"

American PULVERIZER COMPANY

Designers and Manufacturers of Ring Crushers and Pulverizers

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Chemetron Corp., Chicago, moved its southwestern regional headquarters to 519 Braniff Airways Bldg., Dallas, Tex.

United Shoe Machinery Corp. moved its **Pop Rivet Div.** to a larger plant at Shelton, Conn.

United Steel Supply Corp. and its **United Alloy Steel Div.** moved to their new offices and warehouse at 20495 Woodingham, Detroit 21, Mich.

ASSOCIATIONS

J. K. McEvoy, formerly sales manager with Unit Steel Co., has been appointed executive secretary of the **Great Lakes Fabricators Association**, Detroit.

Automatic Welding Machinery Association has been organized with headquarters at 1010 Euclid Ave., Cleveland 15, Ohio. E. W. Hollis, Lewis Welding & Engineering Corp., Bedford, Ohio, is president; Willard Gunzelman, World Electric Co., Cleveland, vice president.

John D. Bradley, Bunker Hill Co., San Francisco, has been re-elected president of the **Lead Industries Association**, New York.

Industrial Research Institute Inc., New York, named Dr. R. W. Cairns president and R. G. Chollar vice president and president-elect. Dr. Cairns is director of research, Hercules Powder Co. Inc., Wilmington, Del. Mr. Chollar is vice president, research & development, National Cash Register Co., Dayton, Ohio.

Arnold Arch has been named executive secretary of the **Air Pollution Control Association**, 4400 Fifth Ave., Pittsburgh 13, Pa.

National Association of Architectural Metal Manufacturers, Chicago, announced election of presidents of its divisions: E. P. Benson, A. J. Bayer Co., Los Angeles, Tablet & Letter Div.; D. D. Williams, Brasco Mfg. Co., Harvey, Ill., Store Front & Entrance Div.; J. T. Edwards Jr., J. T. Edwards Co., Columbus, Ohio, Iron & Steel

BARIUM
STEEL CORPORATION

has changed its name to

PHOENIX
STEEL CORPORATION

PHOENIXVILLE, PA., May 1—The stockholders of the Corporation in their annual meeting have just overwhelmingly approved the change in name from "Barium" to Phoenix Steel Corporation.

The management of the Corporation believes that the effectiveness of its manufacturing, purchasing, sales, financial and other efforts will be substantially enhanced by the identification of all its operations with the "Phoenix" name under which its products are sold.

The name Phoenix has long been used by both major subsidiaries of the Corporation: Phoenix Steel Corporation and Phoenix Bridge Company. Since 1783 when the first iron was rolled at Phoenixville, nails, iron, cannon, railroad rails, steel plate, structural steel and, most recently, seamless pipe and tubing from the Phoenix facilities have played an important part in the nation's growth.

The Phoenix Bridge Company, founded in 1864, and the oldest in the country has also played a prominent part in the development of this country's unparalleled highway and railroad systems.

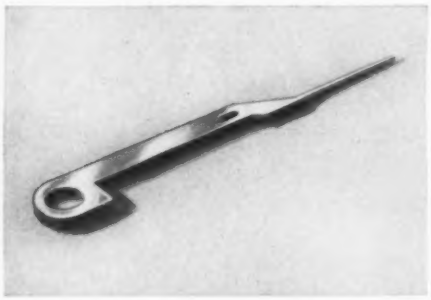
With another period of growth in prospect for this long-lived company, it is both fitting and efficient to identify all the Corporation's activities under its historic name: PHOENIX.*

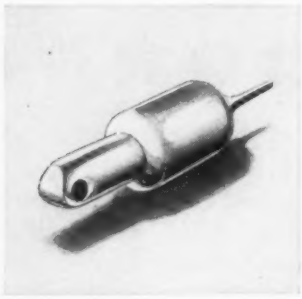
PHOENIX STEEL CORPORATION

** At the annual meeting, the stockholders were told that, "a turnkey contract for the construction of the company's proposed oxygen steel-making plant at Burlington, New Jersey, will likely be signed in 60-90 days."*

NEWS
from Torrington on
SMALL PRECISION METAL PARTS

"Custom manufacture" need not be costly—at least, as practiced at Torrington's Specialties Division. Our engineers, experienced in a multitude of methods and operations, have a knack for fitting the most efficient techniques to any small metal part in question. And these methods are not necessarily the most obvious. The motto might well be, "Precision at any cost—so long as it's the *lowest* cost possible!"

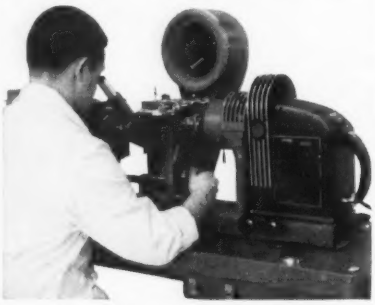




Take the control pin and sensing pin we make for a leading business machine manufacturer. Diameter of the circular section must be held to .001". Other critical dimensions require as stringent tolerances. Torrington selected a combination of stamping and swaging operations as most economical and efficient. High accuracy is achieved without tool marks or stress concentration points. Parts are tempered to RC 52-54, and are accurate to required tolerance *without grinding* and have a better finish than grinding would produce!

Then there's the pin we make for an aircraft application. Made of 440C stainless—a difficult material to work—it is finished to 8 micro-inches, again without grinding. The three radii are held concentric to .006". After tempering to RC 52-60, the part is given a .0002 to .0004" hard chrome plate.

Part of the perfection of the finished unit is the quality of material used. Skilled metallurgists have access to the most modern laboratory equipment to make sure materials meet your drawing specifications. We maintain three separate heat-treating departments, each with equipment selected for specific types of parts or materials involved. Statistical quality control methods insure the quality of product you specify. For help with



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The Torrington Company, Specialties Division, 900 Field Street, Torrington, Conn.

TORRINGTON SPECIAL METAL PARTS

Makers of Torrington Needle Bearings

Div.; S. M. Olson, C. W. Olson Mfg. Co., Minneapolis, Non-Ferrous Div.; and R. L. McKenzie, Flour City Ornamental Iron Co., Minneapolis, Metal Curtain Wall Div.

Dr. G. A. Downsbrough was elected president of the **Scientific Apparatus Makers Association,** Chicago. He is president and treasurer of Boonton Radio Corp., Boonton, N. J.

NEW OFFICES

A. M. Byers Co., Pittsburgh, opened a sales office at 1-D E. Grace St., Richmond, Va., in charge of D. F. Williams.

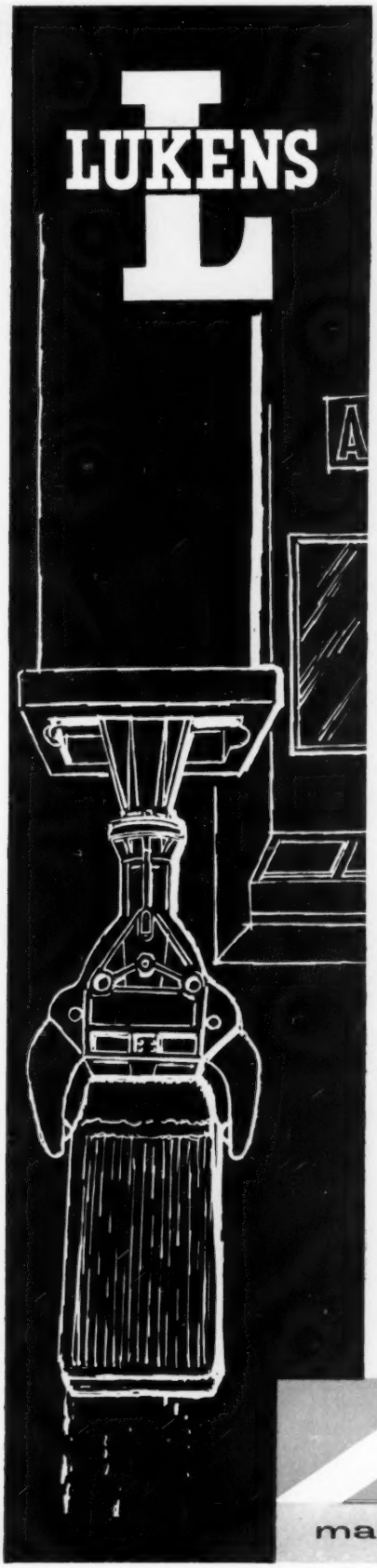
Bailey Meter Co., Cleveland, opened a sales office at 110 Halsted St., East Orange, N. J., under the managership of H. C. Wheaton, who also manages the company's New York district office. Bailey Meter makes industrial instruments and automatic controls for the power and process industries.

R. D. Werner Co. Inc., New York, transferred its New York sales and advertising offices and the Aluminum Safety Products Div. to its plant at Greenville, Pa. The firm's principal products are aluminum ladders, stages, scaffolding, sink frames, and metal molding.

NRC Equipment Corp., a subsidiary of National Research Corp., Newton, Mass., established an engineering office at 499 Hamilton St., Palo Alto, Calif. Edward G. Ferrari is manager of the engineering office. The firm makes high vacuum equipment.

Eimco Corp., Salt Lake City, Utah, is building a branch office and parts depot on Penn Lincoln Parkway West, Pittsburgh. The firm's products include tractors, loaders, mining machinery, and process and filter equipment.

Electronic Engineering Co. of California, Santa Ana, Calif., opened a branch office at 1101 Vermont Ave. N.W., Washington 5, D. C. L. M. Baxter is the Washington district manager.



looks to

Alliance

from the deepest soaking pits in the nation

For highest efficiency and greatest strength in Operation, Lukens Steel Company looks to THE ALLIANCE MACHINE COMPANY.

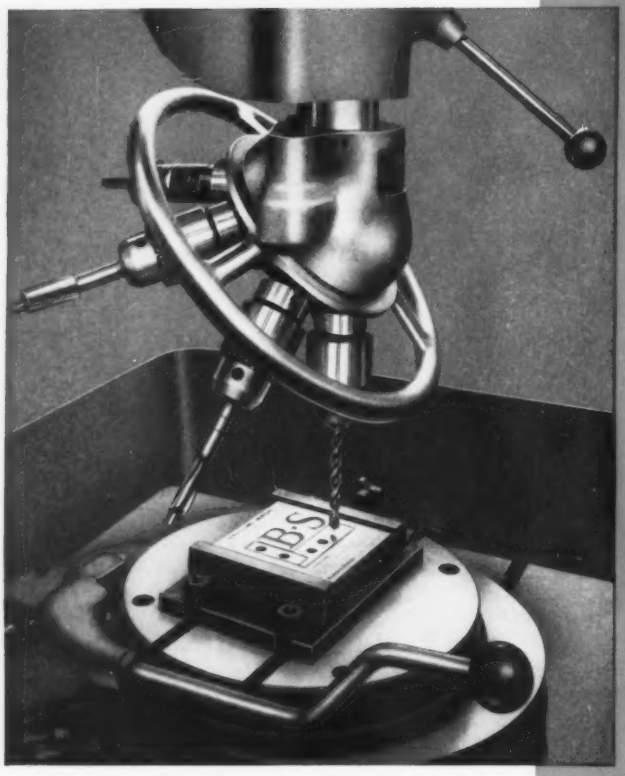
To Service the 12 new submerged furnaces, where steel ingots are heated as high as 2,350 F, Lukens has installed an ALLIANCE Soaking Pit Crane. Its intensified grip is designed and built to handle safely ingots of any size and weight. Here at Lukens, ingots weighing up to 75 tons each are lifted easily.

THE ALLIANCE MACHINE COMPANY is proud of its contribution to the current Luken's Expansion program.

the Alliance machine company

Main Office:
Alliance,
Ohio

Now... from Brown & Sharpe's the turret drilling machines



The Brown & Sharpe Turret Drilling method utilizes a machine on which all six spindles work on a single axis. As the turret is indexed from spindle to spindle, the tool in use is locked into accurate alignment with the main machine spindle. Simultaneously, the work is rapidly and accurately positioned by means of a Brown & Sharpe work-positioning table.

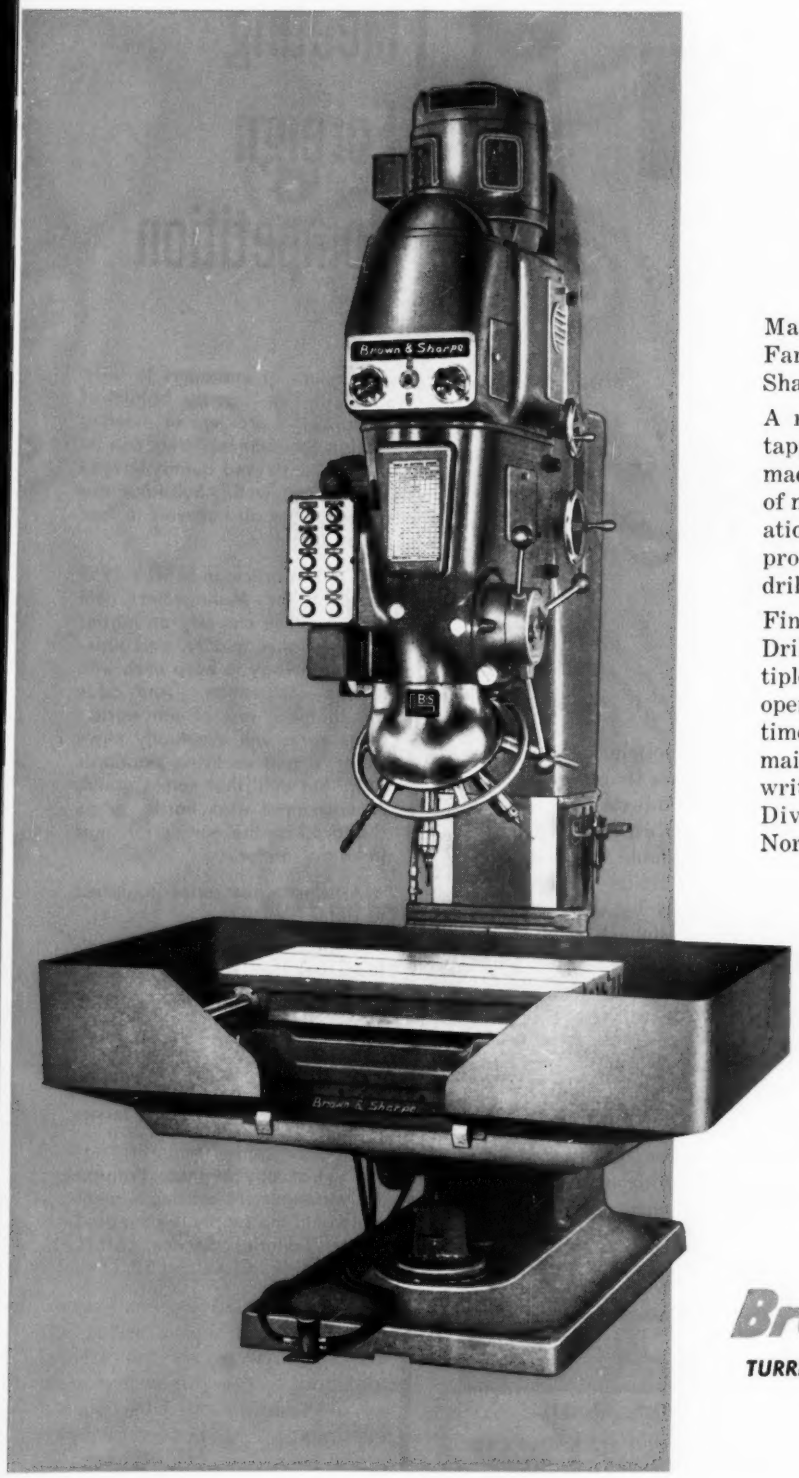
The result of this technique is an increase in production up to 5 times as compared with conventional multiple or gang-type drill presses.

MODEL A 6 spindles • ½" drilling and tapping capacity in steel • preselective spindle speeds, 200-4000 rpm, infinitely variable, on each spindle • preselective electrical tapping and depth controls on each spindle • table work surface 22"x24"

newest division...

that are saving up to 80% in

- drilling
- tapping
- boring
- reaming



Brown & Sharpe Turret Drilling Machines were developed by Howe & Fant, Inc., now a division of Brown & Sharpe Mfg. Co.

A revolutionary concept in drilling and tapping equipment, these turret drilling machines have been proved over a period of many years in all types of drilling operations, with records of 2 to 5 times greater productivity than with conventional gang drill box-jig methods.

Find out how Brown & Sharpe Turret Drilling Machines can help you make multiple savings in your drilling and tapping operations — in handling time, set-up time, capital investment, floor space and maintenance. For complete information, write: Brown & Sharpe Turret Drilling Division, Inc., 20 Fitch Street, East Norwalk, Connecticut.

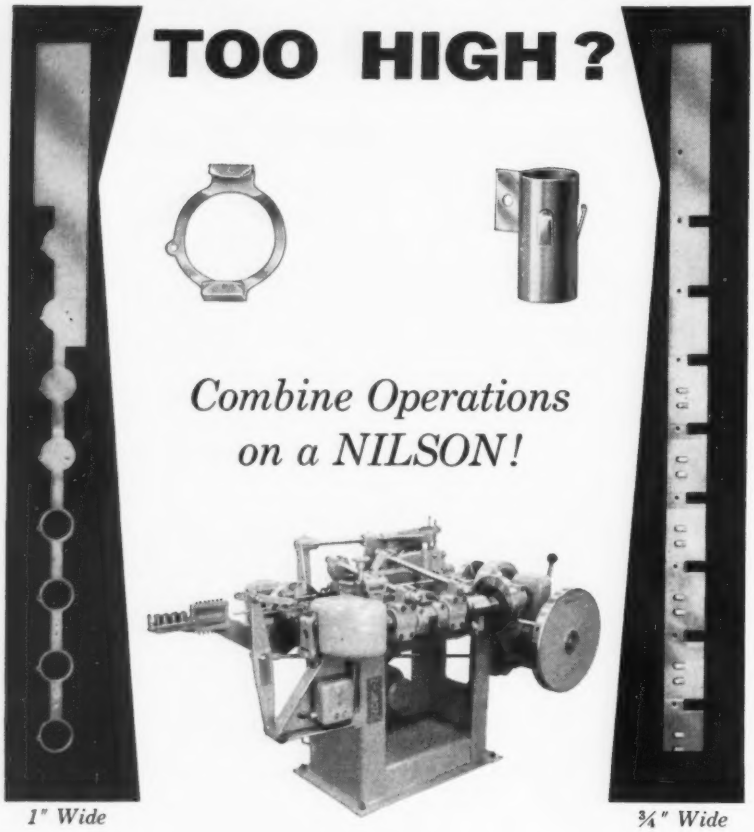
MODEL B 6 spindles • 1" capacity in steel • preselective spindle speeds, 125-2000 rpm, infinitely variable on each spindle • preselective spindle feeds, .0025-.021" per revolution, infinitely variable on each spindle • preselective electrical tapping control and depth control on each spindle • preselective turret index, manual or power • table work surface 28" x 32". Machine functions may be combined with any standard numerical control (tape control) system for fully integrated automatic machining and work positioning.

Brown & Sharpe

TURRET DRILLING DIVISION, INC.

BS

STAMPING COSTS TOO HIGH?



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Stamping costs soar when additional operations must be performed. But a Nilson 4-Slide with built-in press combines stamping *and* forming into one automatic operation . . . no secondary handling . . . ensures product uniformity.

The electronic component shown at left is made of spring-tempered Phosphor bronze, .010" thick. Specifications called for .0002" tolerances on critical dimensions —and allowed a total cumulative error of only .001"!

Solution: A simple progressive die and ingenious 4-slide forming tools are producing this piece at the rate of two finished parts per second. Production costs are substantially lower than if tooled for a conventional press.

With *nine* standard working motions available on a Nilson 4-Slide, production performance is limited only by the ingenuity of the tool designer!

If you produce wire forms or small metal stampings, Nilson's 4-slide forming techniques can point the way to lower costs. Send prints or sample parts for engineering recommendations.

Write today for the Nilson General Catalog on Automatic 4-Slide Equipment.

Parts & production data, courtesy of Plaza Tool & Die Corp., Long Island City, N.Y.

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Coming June 15

Meeting Foreign Competition

The failure of managers to keep wages in line is at the bottom of the growing problem of meeting foreign competition. What can be done? Tariffs and quotas haven't worked too well. Subsidies are repugnant to all believers in free enterprise.

The next article in STEEL's 1959 Program for Management will show how we can rely on harder selling, higher quality, and superior technology to keep even with foreign competition. And odds are that the rest of the world's wage rates will eventually move closer to ours as living standards rise. But until that comes about, America must work harder or be displaced as the earth's foremost industrial nation.

Articles in the series published to date:

1. Profile of Metalworking's Managers (Feb. 16, p. 137)

2. Improving Productivity (Mar. 16, p. 103)

3. Keeping Wages in Line (Apr. 13, p. 95)

4. Giving More Public Service (May 18, p. 99)

An extra copy of these Program for Management articles is available until the supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.

Giving More Public Service

GOOD BUSINESS CLIMATE—you can't cuss your way into it. You can't buy it. You can't wish it into being.

Unfortunately, management and managers have tried all three. And the typical manager still complains:

"Depreciation laws are outmoded . . . corporate taxes are too high . . . zoning laws in many areas discourage and prevent expansion . . . the power and influence of labor leaders on our government and economy are way out of proportion . . . we give the maximum to our community—and get the minimum in return."

Like anything else, you have to work at it to create and maintain good business climate. The emphasis is intended for you, the individual, because good business climate is becoming an increasingly important facet in the changing role of the metalworking manager.

Practicing good community relations and the development of good business climate have been almost synonymous in the postwar period. In the "be a good neighbor" concept which top management has embraced, managers have been doing an excellent job. They've led fund raising campaigns for Community Chest and Red Cross. They've organized Junior Achievement, supported the Boy Scouts, participated in the Parent-Teachers Association, coached Little League baseball, and joined service organizations like Rotary and Kiwanis.

But one shortcoming stands out: An indifference toward politics and government.

Reflect for a moment on the basic elements of good business climate—those which enable a company to prosper and grow and contribute to a community's higher standard of living. Politics and the government it creates really determine the

type of business climate in which we operate.

The blame for the blank spot is ours. As companies, we have formally (via written policies) or informally discouraged our managers from "playing politics." As individuals, we've been devoted to our functions in administration, manufacturing, engineering, purchasing, and marketing and by default have left "politics to the politicians."

But last fall's elections triggered a new concern for politics and the trend of our nation's business climate. Executives from some of our leading corporations began to inject a new note of urgency into speeches warning of America's drift toward socialism. Thomas R. Reid, director of civic affairs, Ford Motor Co., expressed it this way at an American Management Association meeting in Los Angeles:

". . . unless we make politics an essential part of our business, we are going to find it increasingly difficult to do business at all."

The problems of business climate, explains Robert Paxton, president of General Electric Co., are no more mysterious or complex than other problems you face daily. State and national government representatives are almost all accountable to some local constituency, and so they are responsive to local action and opinion. The solution to business climate problems, he emphasizes, lies in individual, grass roots study and action.

The New Dimension

This, then, adds an important new dimension—**practical politics**—to the role of the metalworking manager. The time to embrace it is now, while the movement is gathering momentum—the impact will be greater.

What's involved? The obvious first step belongs to top management. It must give its full endorsement and encouragement to the participation of its managers in practical politics.

Step two is like tackling any problem—you must have an organiza-

Rockford Managers Cite Need for Political Action

Industrial executives in Rockford, Ill., decided early this spring to initiate a practical course in politics for its managers. Reason: They believe it's one way to maintain and improve the area's business climate.

The Chamber of Commerce is program co-ordinator. A committee, headed by Clayton Gaylord, president of Ingersoll Milling Machine Co., developed an 11-session course, tailored to the Rockford area's requirements.

Result: About 350 individuals—most of them metalworking managers—are taking the course in their own companies. Here's what four of them think of it.

Awareness of Problem Must Be Developed

"At Ingersoll Milling Machine Co., we have 35 taking the course," says Clayton Gaylord, president. "To me, its most important function is to create an awareness on the part of the individual of the need for his greater interest and participation in political activity.

"The kind of government we have—local, state, and federal—determines the kind of business climate we operate in. To maintain and improve this climate requires the personal efforts of every manager."

tion—within your company and among the firms in your area—to provide leadership and co-ordinate the program.

You can't fly a plane without instruction—the art of practical politics must be learned too. Experience by the leaders shows that in-plant training plays a key role.

The final step is action. The setting of goals can be aided through formal appraisal of the local business climate, but nothing is done unless you, the managers, get out and work.

General Electric Co. can be credited with setting the pace in the new philosophy of having industry and its managers stand up and be counted in matters involving our business climate. It has a government relations department which keeps up to date on political trends and developments, analyzes pending legislation, and advises and assists local plant managers in their daily relations with local, state, and federal government officials.

In Syracuse, N. Y., J. J. Wuerthner Jr., then community activities manager for GE's Electronics Park, developed with other area businessmen and industry managers a course in practical politics which has become the model for most other courses.

Highlighting the need for the course was a business climate survey of the Greater Syracuse area by 125 top industrial executives. These unfavorable factors stood out: High corporate taxes, high state income taxes on the individual, above average costs of unemployment and workmen's compensation, generally unfavorable attitudes by many groups toward business and industry.

The report was given to the Manufacturers Association of Syracuse. Because nearly 90 per cent of the questions asked in the survey involved areas of action by legislative and political leaders, state and local boards, commissions and other government bodies, the association formed the practical politics task force headed by Mr. Wuerthner. (He was recently transferred to GE's executive offices in New York

Practical Politics: It's Good Manager Training

Industry doesn't operate in a vacuum. An effective manager knows more than the technical details of his job and industry—he knows the importance of his community and government.

"That's the philosophy of Elco Tool & Screw Corp.," says Dean Tollefsrud, purchasing agent. "We're using the practical politics course to launch a junior executive development program. Attendance at council meetings and discussions with precinct committeemen have given us new perspectives."

Participation Is Part Of the Job

"To be effective, you have to participate too," says Alan C. Mattison, president of Mattison Machine Works.

An active member of his political party in Rockford, he readily responded when asked to serve on the school board—members are appointed by the mayor. "Our school system is a $12 million business," he relates. "Of course the job is time consuming, but you gain personal satisfaction too. We were able to save over $300,000 in the construction of three schools."

Lack Time for Politics? Re-evaluate Your Activities

Managers have too often leaned on the crutch: "I just don't have time for civic and political activities."

"Every good manager can find the time for worthwhile projects," stresses Hugo Borgnis, manager of budget processing, Aviation Div., Sundstrand Corp. "Many managers spread themselves too thinly and merely 'belong' to many groups." He suggests: Limit yourself to those activities which you feel are most important and in which you can participate with the greatest effectiveness.

How's Your Area Business Climate?

INDUSTRIAL FACTORS

	Good	Fair	Poor
Rate of industrial growth			
Industrial diversification			
Zoning laws			
Utilities			
Availability of transportation			
Police services			
Fire protection			
Co-operativeness of public officials			
Labor quality			
Labor availablity			
Labor climate			

COMMUNITY INFLUENCE

	Complete Control	Strong Influence	Moderate Influence	No Influence
General Public				
Union members				
Local employers				
Press, radio				
Clergy				
Municipal officials				
State officials				
Congressmen				
Educators				

as public affairs consultant.)

This was their five-phase plan of action:

1. A primer of practical politics was prepared. It outlines the make-up of national, state, and local governments, how laws are made, how political parties are organized and function.

2. A *tell and sell* dinner meeting for association members and top management of industrial firms was held. Its purpose was to point up the need for the program to top management and to get its support.

3. A two-day seminar was presented for representatives from participating firms. These men, generally middle managers, formed the nucleus of the seminar leaders.

4. An 11-session course was prepared for use by the seminar leaders in conducting programs in their own plants.

5. Follow-up activities were outlined to improve the program and help maintain interest.

How effective was the approach? A questionnaire was sent to 600 "graduates" the day after last fall's election. These questions were asked:

1. Did you participate actively in politics—other than voting—before you attended the seminars? Only 17 per cent responded affirmatively.

2. Did you participate actively in politics after taking the course? A whopping 91 per cent said, yes.

Here are some other interesting facts the survey revealed: 45 per cent did canvassing work; 38 per cent contributed money to candidates or political parties; 51 per cent attended a political meeting, rally, or campaign event. Remember—these people are businessmen and industrial managers.

You Can Do the Same

You can spearhead the same type program within your company and community. Rockford, Ill., businessmen and industrialists took an approach similar to that in Syracuse. The Chamber of Commerce acted as the co-ordinator of the program—see exhibit on Page 100.

One of the real surprises has been the enthusiasm with which managers have embraced the courses. Hugo Borgnis, Sundstrand Corp.

GOVERNMENT (Rate: Good, fair, poor)

	State	County	Municipality
Financial management			
Efficiency			
Progressiveness			
Attitude toward business			
Taxes			

COMMUNITY SERVICES

	Good	Fair	Poor
Housing			
Schools, colleges, libraries			
Hospitals			
Health, welfare programs			
Banks, hotels, restaurants, shops			
Newspapers, radio, TV			
City planning			

YOUR COMPANY'S COMMUNITY, CIVIC STATUS

	Good	Fair	Poor
Activity in business sponsored projects			
Support of youth programs			
Support of church-industry programs			
Support of education			
Support of civic programs			
Relationship with city, state officials			

seminar leader (see Page 101) has 20 in his sessions. "We combine our meetings with a dinner starting at 6:30," he relates. "The discussions get so lively that we have a difficult time trying to cut them off by 10:30 or 11."

Why the enthusiasm and interest? For most managers, politics is an unexplored fact of life. Their experience has been limited to high school government classes, occasional voting, and listening to a TV or radio address by a major national candidate.

Check your own experience. Have you:

- Written a personal letter to your U. S. senators or congressman?
- Attended a city or town council meeting?
- Personally contacted state senators or representatives?
- Met and talked with your precinct or district committeeman?
- Personally canvassed your neighborhood regarding registration?

Those are some of the things you'll be doing in a practical politics course, plus learning how political parties are organized, how a bill originates, and the procedure it must follow to become law. Such programs are readily available. The National Association of Manufacturers has one; so does the U. S. Chamber of Commerce. Many state groups like Illinois Manufacturers Association are presenting programs for members. And you can expect consultants to come up with some too.

Set Your Own Local Goals

But regardless of its initial fascination, the practical politics we're discussing is not a game or fad. Its basic objective is effective organization to improve the business climate. It involves studying your local—as well as the national—situation, analyzing the assets and shortcomings, then setting goals for improvement.

What kind of climate should business be seeking? GE's president suggests these:

1. Honest and efficient government supported by alert and well-informed voters who have the balanced best interests of all elements of the community at heart.
2. Fair taxes for both business and individuals.
3. Conscientious law enforcement which rejects double standards and protects the rights of all citizens, both corporate and private.
4. Equitable pay and benefits for employees.
5. Responsible union leaders.
6. Qualified and responsive people to fill employment needs, with educational facilities to prepare them for a wide range of job opportunities.
7. High quality community facilities such as stores, banks, utilities, transportation, hospitals and health and welfare facilities, commercial facilities.
8. A social and cultural atmosphere in which people enjoy living and working.
9. A friendly, open minded attitude toward business on the part of local people and their elected representatives.
10. Responsible business and industry citizenship.

Ford Does It This Way

Ford Motor Co. has developed a business climate inventory form to aid its local plant community relations committees in appraising their areas. The checklist on Page 102 is adapted from it.

The inventory covers some 35 pages and contains about 180 questions. Some questions require answers which are the opinions of the community relations committee; some can be answered from plant

records; others require information from outside sources, such as Chambers of Commerce and government agencies.

Ford has 50 community relations committees functioning in its national network of plants—most have completed their climate inventories. From the appraisal, each committee was also requested to outline conditions which it felt could be improved through efforts of the company and other business citizens. Both short (two years and under) and long term goals were encouraged.

One of the basic values of such a survey is that it makes the manager more aware of his community —its assets as well as its shortcomings. It often highlights situations about which he had no knowledge, J. P. Martin, manager of Ford's community relations, points out.

One Ford manager, for example, prides himself in knowing his community, its operations, officials, and leaders. But one question in the survey stumped him—when was the zoning code inaugurated or last revised? Investigation showed that the code in his community was 40 years old and badly needed revision.

You will note that no mention has been made of political parties.

Every executive contacted by STEEL stressed this important point: This practical politics movement is not anti-Republican, anti-Democrat, antilabor, or antianything. It is true that most executives, Republican and Democrat, feel that labor's influence and power in government are far out of proportion to the number of people represented.

How Are Your Community Relations?

DO YOU KNOW YOUR . . .	Know his name 1 point	Speaking Acquaintanceship 3 points
U. S. senators		
U. S. representatives, your district		
State legislators, your district		
County commissioners, or supervisors		
Sheriff		
Mayor		
City councilmen		
Public works department heads		
School officials		
Key police officials		
Chamber of Commerce officers		
Administrative heads: Red Cross, Community Chest, Boy Scouts, YMCA, service organizations, church councils		
Local chairman of your political party		
Your precinct committeemen		

Learn from the Unions

The unions have won that power through hard work, particularly on the part of the Committee on Political Education (COPE) of the AFL-CIO. A real lesson can be gained by studying its activities. It proves the axiom: "Government belongs to those who practice it best."

In its recent *Political Memo*, COPE reported that 600 delegates have attended its political education and action conferences being held coast to coast.

The objective of the practical politics movement in business and industry is to reactivate the large, politically inactive, middle income group. "It's the fastest growing group in the country, composed substantially of whitecollar and middle management employees," said Henry Ford II in a recent talk at Yale University. "This group, by one estimate, amounts to 30 per cent of the electorate. It could be playing a dominant role in politics."

Most executives feel that this group's participation will upgrade the quality of representatives in both parties and achieve a better balance of interest of all segments of the community in government. Business climate improvement will then evolve on its own.

Most metalworking managers are already active in community relations. Motorola Inc. provides an example of community-relations-conscious managers. A survey of 100 of its middle and top managers showed that over 60 per cent of them participate regularly in their community affairs. The average executive worked with four organizations—one plant's top executive was active in 12! But only seven managers reported participation in political affairs, and that percentage is above the average for most companies.

Ford's Mr. Reid suggests that you re-evaluate your community relations activities. "Being good citizens is not enough," he emphasizes. "The goal should be to become an effective citizen. Don't try for volume in joining groups. Partici-

Recognize Him?
He Evades Community Responsibilities

1. Cozy Clyde "That's not my problem. Let the do-gooders and politicians take care of it."

---

2. Shrinking Sam "That's too hot for us—can't afford to take sides, or get involved."

---

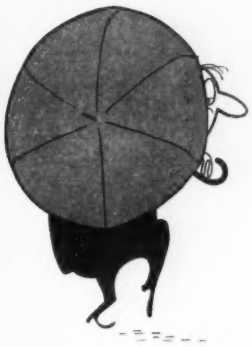
3. Conniving Carl "Who do we know who has pull?"

---

4. Busy Buzby "I'm too busy—got all I can do to take care of my own job."

---

5. Fireman Fred When the emergency comes (and the damage is done), he will rush in to help put out the fire. Then he disappears until the next one. (Yet he's the best of the group)



pate in those in which you can work effectively—and political affairs should be one."

How effective can practical politics for business and industry be? Examples are in abundance.

Here's the Place to Start

A few years ago a group of businessmen in one Illinois county organized to improve the area's business climate. Their activities started at the logical point—the precinct. By becoming a force at that level, they gained influence with the county chairman of the party.

From the start, the county chairman knew he could depend upon this group's full-time co-operation. Members helped in the solicitation of funds. They wrote advertising. They booked speakers. In short, they exercised the talents of most managers and businessmen.

Result: The party (Republican) made a clean sweep of the county slate—the first in more than 20 years.

The important thing to remember, the officials emphasize, is that your activities don't stop with a successful election. You have follow-up activities, such as the patronage jobs involved and continuing contact with the elected officeholders.

One eastern executive offers this bit of advice: Remember a politician's first debt is to his district. "I'm a Republican and recently I had to call on one of our state senators to get something done. I went to the Democrat because he was more concerned about my area than the Republican—that was where he got his start. Result: I got excellent co-operation—party affiliation was not involved—it was the local constituency that was important in this instance."

One of the biggest eye openers to managers new to practical politics is the relatively low caliber of the party worker at the local levels. Many are minor patronage jobholders whose only interest is in retaining the position. So county and state officials can exercise excessive power in many instances.

In most cases, the "party pros" will welcome you, your time, and ability. At first you may find yourself relegated to some minor tasks while you learn the rudiments. But your climb within the ranks, you'll

find, will depend pretty much upon such universal values as competence and industry.

What's the law?

As an individual, you have the same rights and privileges as any other citizen.

The Federal Corrupt Practices Act prohibits a corporation from making a contribution or expenditure in connection with a Presidential or Congressional election, primary election convention, or caucus held to select these federal officials, the Illinois Manufacturers Association points out.

Do These

But as a company you can:

- Urge employees to register and vote.
- Circulate public affairs information through newsletters to management.
- Discuss issues through plant publications.
- Invite candidates to tour your facilities.
- Encourage employees to run for public office.
- Assign responsibility for public affairs matters to high-level staff executives.
- Hold informational meetings with political and government specialists to inform your management on issues.

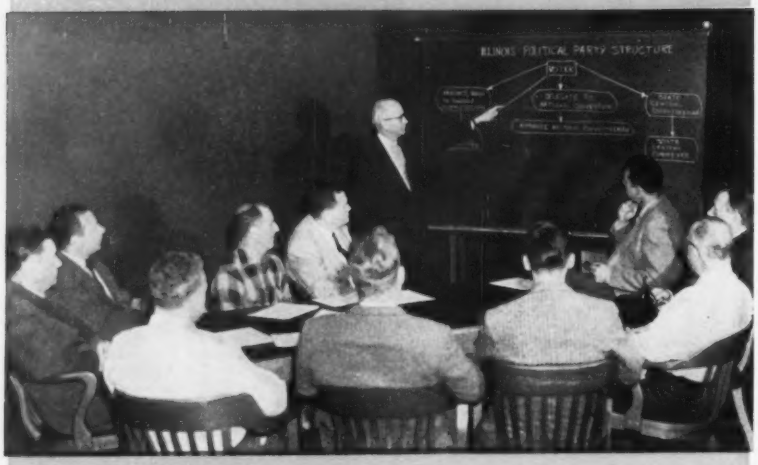
Leaders in the practical politics movement report that you can expect amazing results almost immediately at the local level. But substantial impact on the national business climate will come slower—perhaps five to ten years. Success is threatened by two major pitfalls:

1. The businessman and industrial manager may lose his enthusiasm for practical politics—it takes time and work.

2. The inevitable bumps and bruises will scare many away. You must expect some abuse—that's part of practical politics. You may find some managers taking stands opposing that taken by the company—it has to be expected.

The movement to rouse the politically asleep citizen in the middle income bracket is just getting started. The big target: Business climate improvement. That's an important part of your responsibilities as a metalworking manager.

Bastian-Blessing Promotes Grass Roots Citizenship



The dozen men above form the Government Information Committee of Bastian-Blessing Co., Chicago. Their function:

1. Provide all employees basic information on the operations of government—local, state, federal.

2. Investigate candidates for public office and political and legislative issues. Findings are translated into recommendations to the employees.

"Our basic objectives," outlines H. C. Shellhamer, treasurer, "are to make our employees better informed on political matters and to encourage them to become more active in politics at the local level."

The program, started last summer, is nonpartisan. Committee members include representatives from all levels of the firm—top management to hourly paid men.

The committee was particularly active during the fall and spring election campaigns. Illustrating objectiveness, it recommended Democrats for some offices, Republicans for others, and in some instances reported both candidates equally qualified or unsatisfactory. As important issues come up at the local, state, or national levels, the committee investigates and follows up with recommendations on what employees should request from legislators.

"We feel that the employees have welcomed the program," relates Mr. Shellhamer. "There's good evidence that most of them are taking the literature home. We've had many requests for additional material which the individual has sought on behalf of an outside group to which he belongs. Stockholders, who also receive the material, have commended the committee's efforts."

"Down time's" double, and he's in trouble!

Alas, poor foreman! The plant manager is really blowing up. And so soon, too!

For the idle man-hours he's beefing about were chalked up only yesterday. Yet the whole story was on his desk today—thanks to the speed of Automatic Keysort punched-card controls.

Time was when below-standard performance went undetected for weeks, while overhead leaped upward like a gazelle. Slowly-processed figures were to blame. But now Keysort gives the plant manager a detailed summary of the previous day's labor costs by 2 P.M. each afternoon. Knowing the facts, he can move to correct wasteful in-plant situations *on time* —before they turn into profit drops.

Automatic Keysort is today's only data processing system that provides a family of integrated machines and methods designed for automatic creation and processing of original records. Speeding vital day-to-day and long-range facts essential to sound management, this unique system fits easily into your present operations . . . is highly flexible to future growth and expansion.

With the Automatic Keysort System, manufacturing concerns of every size can now enjoy fast, accurate data processing on either a centralized or decentralized basis. Without restrictive, complex procedures. Without specialized personnel. And at remarkably low cost.

Call your nearby Royal McBee Data Processing Representative, or write Royal McBee Corporation, Data Processing Division, Port Chester, N. Y. for illustrated brochure F-2.

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No other method of fabrication can compare with the forging process for dependability. The uniformity and predictability of physical properties with minimum variance from piece to piece or from one location to another in the same piece is assured to the greatest degree by modern forging practice.

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Technical Outlook

May 18, 1959

IRON OUTCLASSES STEEL—A new specialty wrought iron called "MN" is said to have better impact and low temperature properties than most steels. A. M. Byers Co., Pittsburgh, says that manganese content accounts for the superior performance.

TEST FOR COATING THICKNESS—You can determine the right thickness of zinc-rich coatings for maximum protection of steel by a conductivity test devised by D. S. Nantz, Wright Air Development Center, Wright-Patterson Air Force Base, Ohio. The procedure also tells the best concentration and drying time.

EASES METALLOGRAPHIC PROBLEMS—A new polishing procedure which uses diamond abrasives eliminates several problems in preparing metallographic samples: Loss of nonmetallic inclusions, distortion of surface, insufficient flatness. A single basic technique eliminates several specialized procedures, says E. C. Olden, Frankford Arsenal, Army Ordnance Corps, Philadelphia.

TESTS METALLIZED COATS—Eight years of exposure have proved the value of sprayed aluminum and zinc coatings on carbon steel. A test program still underway at the American Welding Society, New York, seems to indicate that all coatings (regardless of thickness) give complete protection.

MULTIPLIES LIGHT NINE TIMES—A transistorized fluorescent system is being tried out on a Cleveland Transit System bus. It provides from three to nine times as much light as hot filament lamps but uses three-fourths as much electricity, says General Electric Co.

WHIPPING TOUGH METALS— Gas plating and plasma arc torches offer great promise for fabricating parts from nickel, cobalt, molybdenum, tungsten, and other refractory metals, says Arthur D. Lytle, vice president of research, Union Carbide Metals Co., a division of Union Carbide Corp., New York. Parts can be built up with gas plating over dissolvable molds. Deposits are reasonably thick and 95 per cent dense.

CO_2 WELDS STORAGE TANKS—A yokelike frame, two welding heads, flux-cored wire, and carbon dioxide shielding make for faster, more economical outdoor welding of mild steel storage tanks, says Arcos Corp., Philadelphia. Continuous wire feed eliminates downtime for changing electrodes.

QUICKER CLEANERS— Those who have battled with rust preventives on things that have been stored for some time can appreciate an Army Ordnance solvent cleaner which is said to reduce cleaning time 60 to 70 per cent. A similar development for loosening carbon eliminates the need for phenols, creosol, and chlorinated solvents used in today's commercial degreasers. You can get the formulas from the Army's Coating & Chemical Lab., Aberdeen Proving Ground, Maryland.

NEW REFRACTORY MATERIAL— Particles of graphite bonded with silicon carbide are the latest lightweight entry in the superrefractory field. The product is made by the Carborundum Co., Niagara Falls, N. Y., for use on high speed rockets and aircraft.

ALLIS-CHALMERS SWITCH— A new electronic relay designed with commercial components is said to be the first major departure from conventional induction relays in 50 years. Allis-Chalmers Mfg. Co., Milwaukee, expects to use the design on its latest switchgear.

NUMERICAL CONTROL MARCHES ON—An order for 50 numerical control systems makes Burg Tool Mfg. Co., Gardena, Calif., one of the largest buyers. To date, it has ordered 75.

FASTENERS: Make or Buy?

Small parts seem like natural operations to keep your idle capacity busy, but they may prove to be a luxury. Draw on the fastener maker's knowledge; it may save you money

Your answers to these questions developed by the Industrial Fastener Institute will give you a clearer image of your production-profit picture

The Part

Is its design a factor in assembly?
Is design changed frequently?
Can it be made in one piece?
How much metal (including scrap) is used for each part?

Its Production

What's the volume?
What additional capital equipment will you need?
Will your facilities handle higher volumes?
Are materials readily available? Will they continue to be available?
Will part redesign speed assembly or save materials?
Does volume fluctuate suddenly?
Do you have enough floor space for equipment and inventory?
Are your quality control facilities comparable to those of outside sources?
Are you equipped to salvage or divert parts to other uses?
Will your machine operators need extra training?

Its Tooling

Is your staff skilled enough to design, tool, and produce the part?
Do they have the knowhow to institute design changes?
How many operators will you need for emergency production?
How do your die costs compare with labor costs?

Its Profitability

Have you checked your total costs against those of outside venders?
Are your costs based only on current market prices? What happens if material and labor costs go up?
What prices are you paying for alloys?
What volumes (materials and production) do you need to get a price break from a supplier?

PRODUCING FASTENERS and other small parts for your product seems like a natural for captive operations, particularly if you have idle capacity.

But Frank Masterson, president, Industrial Fasteners Institute, Cleveland, claims that 96 per cent of the companies making their own fasteners could buy them cheaper from fastener manufacturers.

Volume production, the ability to change over with new designs, and the ability to buy materials in volume tend to give fastener makers a cost edge over captive shops in the production of small parts, explains Mr. Masterson. He adds that companies looking for captive business tend to underestimate their floor space requirements for stocking inventory and the cost of supplemental annealing or plating facilities.

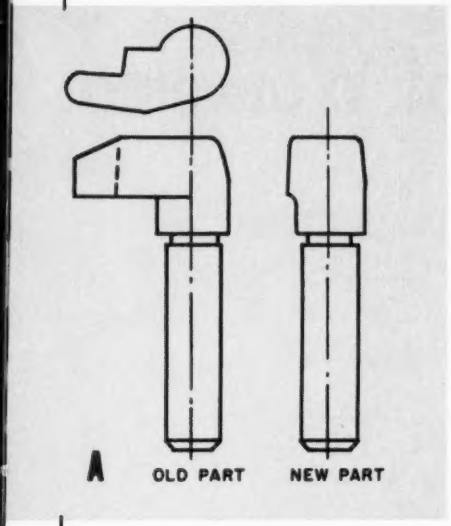
Salvage costs are another hidden factor. Mr. Masterson cites an Ohio firm that decided to make its own screws. It produced 250,000 screws with faulty threads and had no means of salvaging them. A fastener maker would be able to divert the screws to other operations—possibly resize or recut them to absorb some of the loss.

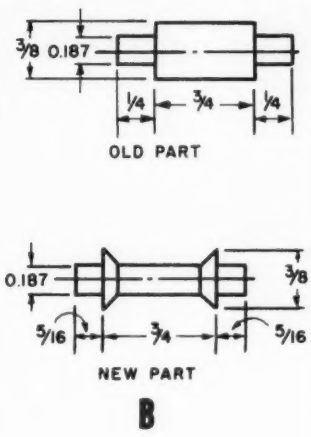
• **In efforts to cut costs even more, fastener makers are turning to cold heading.**

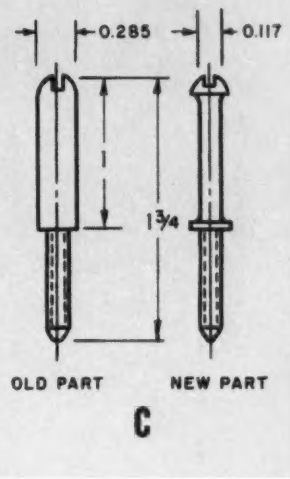
The firms usually have enough volume to justify the capital investment required—but a captive operator often has to continue with screw machines. As the examples above indicate, this can be costly.

Another example is a Connecti-

Redesign or new methods may tip the balance from make to buy







These examples show how manufacturers can take advantage of specialized outside knowledge of materials, design, and fabricating techniques:

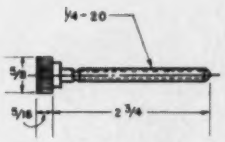
A—Throttle lever for automatic transmissions was formerly two parts with a cast iron head manually assembled to a steel shaft. It is now produced in one piece by cold heading. The cost is roughly 60 per cent less.

B—Stainless shelving spacers were volume machining products. They are now made by cold double heading operations. Saving in scrap metal is $4.50 a thousand; total saving on part adds up to 34 per cent.

C—Redesigning a mounting screw to include collar and slotted head for cold heading dropped costs 41 per cent.

	MACHINING	COLD HEADING
Stock requirements (lb)	298	69.5
Finish weight (lb)	65	69.0
Wasted stock (%)	77	0
Production (pieces per machine hour)*	210	3864
Costs per 1000 pieces in quantities of:		
5000	$80.37	$20.59
25,000	63.14	17.80
50,000	61.39	17.14
100,000	60.45	16.78

*First operation only.



The table at left indicates estimated cost differences when producing this special knurled head bolt by machining vs. cold heading.

cut firm which was producing subassemblies under contract. One component was machined in four annual lots of 25,000 each at a cost of $33 per thousand. Collar and tenon thickness and over-all length were vital for fastening operations.

When the firm was told to cut costs $2000, it called on a small parts specialist who shifted production to cold heading without sacrificing tolerances. Costs were reduced $8.58 per thousand, saving the order.

Before you decide it's cheaper to make than buy, cost out your proposed operations against the checklist. You may find it will be better to let someone else do the job. If you're dealing with large volume, an outsider often can give you price discounts that will make up for any initial savings via the do-it-yourself route.

New Finishing Material Conforms to Shape of Workpiece

- **One user reports a 25 per cent cost reduction in his finishing line. Production is up 50 per cent.**
- **You can use it for automatic, semiautomatic, or hand finishing.**
- **Maker says it can replace buffing and polishing for final finishing.**
- **It's light and can be used for portable and touch-up work.**
- **Material is a cost cutter on pickling lines. You get cleaner metal faster.**

LOOKING for ways to cut finishing, cleaning, or pickling costs? You may get help from a new finishing material called Scotch-Brite, a product of Minnesota Mining & Mfg. Co., St. Paul.

Here's the secret: Nylon web is impregnated with fine abrasive. Discs can be ganged on a spindle to any width. (It's also available as sheets and rolls).

The material is about ¼ in. thick. Five discs can be combined to form a loading about 1 in. wide. The biggest width commonly used can finish steel sheets 60 in. wide.

It's available in 6, 8, 10, 12, and 14 in. discs. Very fine, fine, medium, and coarse types are made.

• It can produce a unique finish at a lower cost than other finishing methods, says the maker.

The material is already in use on stainless steel, plus aluminum, zinc, brass, copper, titanium, and other nonferrous metals.

• Big advantage: It effectively follows conformations.

Stainless steel window frames are one example. Finishing costs are at least 25 per cent lower than they are with other finishing materials, says Flour City Ornamental Iron Co., Minneapolis. Its polishing line production was increased by 50 per cent. With one pass under the material and dissimilar mill finishes (all rated as 2B) are given a consistent piece-to-piece finish.

• It's suitable for use on automatic, semiautomatic, and hand operations.

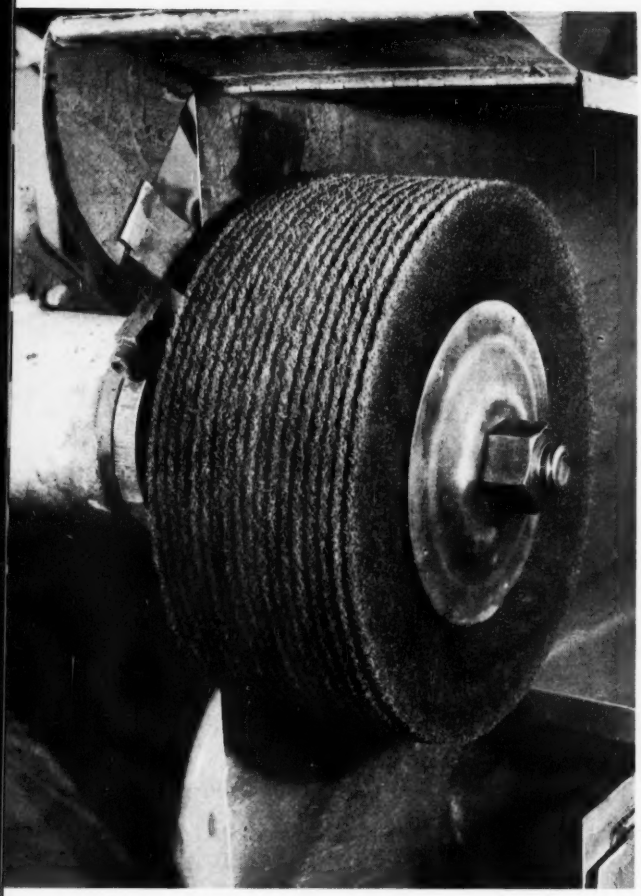
The company says the material can replace buffing and polishing compounds for final finishing. It is light and easy to use with portable tools. Finishes damaged in shipping or assembling can be easily blended on the job. All the difficulty is taken out of matching finishes, says 3-M.

Items now being finished on a production line basis include aluminum extrusions, diecastings, tubing, forgings, stampings, and sheets. Both copper and stainless sheets and tubing are being finished. The material is said to be suitable for the finishing of furniture, restaurant fixtures, elevator and escalator trim, jet blades, and food equipment.

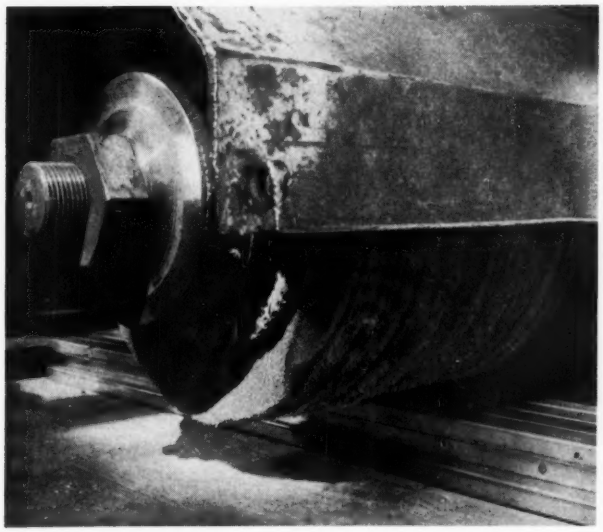
• On pickling lines, the material speeds up operations, produces cleaner steel.

Stainless steel producers using the material say their line speeds are nearly doubled. Cleaner strip than ever before is reported by one user. Indications are that it gets to the bottom of the scale pits better than materials now used by steel plants.

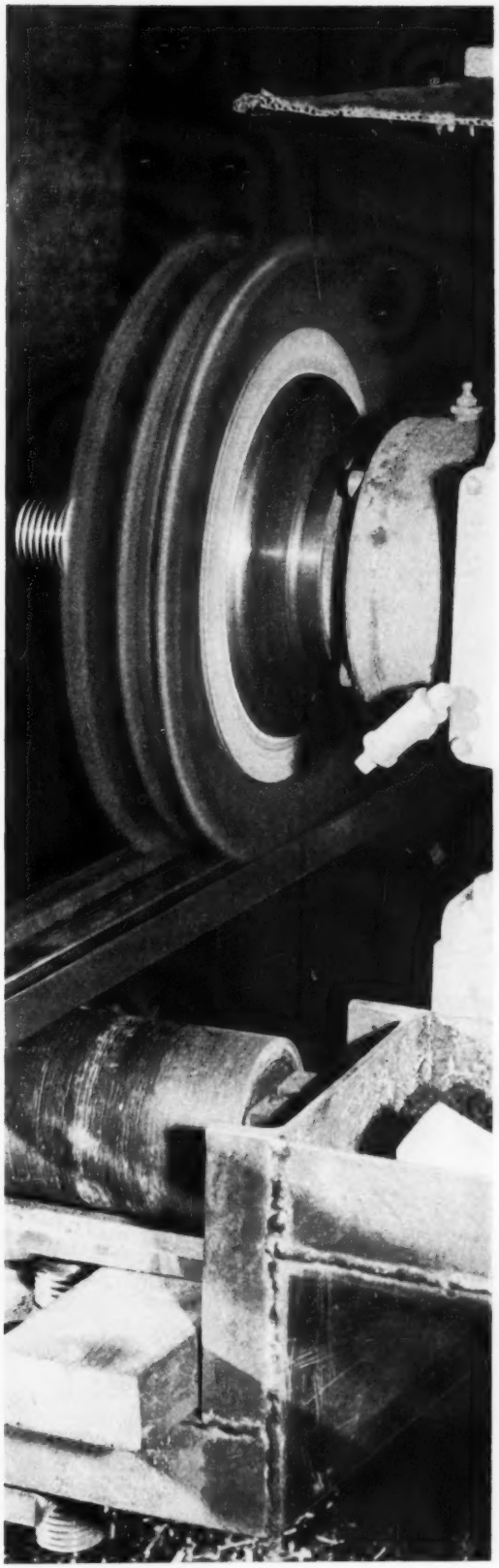
The strip is exposed to the brushing and cleaning between pickling tanks. Scotch-Brite is not intended for stock removal.



The finishing material can be used for offhand or automatic finishing operations. It's available in discs, sheets, and rolls



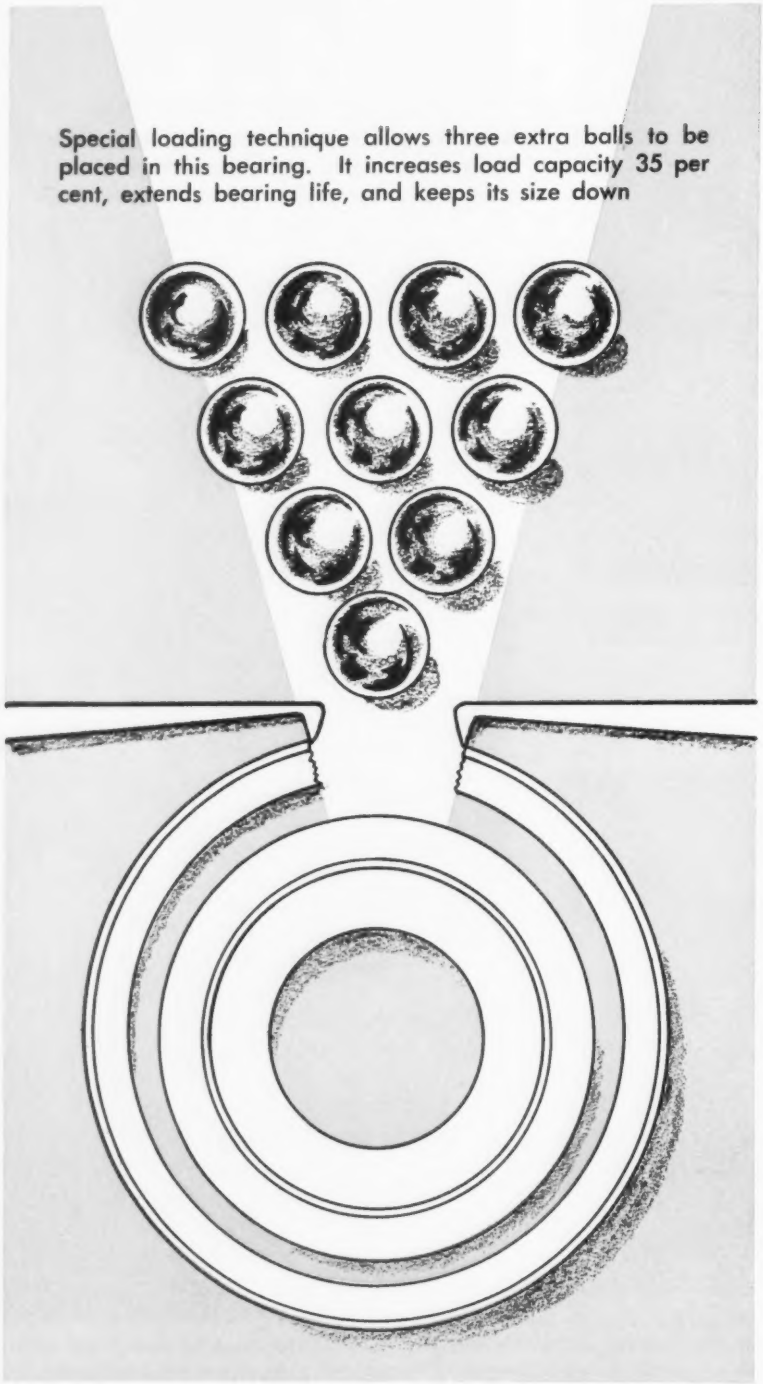
The 18 in. wide loading uses about five discs per inch of width (with spacers). Here it's in working position over stainless window frame parts. Finish on the steel is 2B



It conforms easily to the shape of nearly any workpiece. Channels and grooves are easily finished

Split Bearings Solve Special Jobs

Increased load capacity, relative space and weight saving are merits of single fracture type. Double fracture type can be assembled where solid race bearings can't be used



Special loading technique allows three extra balls to be placed in this bearing. It increases load capacity 35 per cent, extends bearing life, and keeps its size down

NEED a bearing that will give you increased load carrying capacity without increased size? Or a bearing that can be installed where conventional types cannot be used?

Split ball bearings satisfy both conditions. Specialty items, they will cost you more than conventional bearings, but they can eliminate costly designs that will more than pay for the difference in price.

• Split ball bearings are produced in two types: Those with a single fracture and those with double fractures.

In single fracture bearings, the outer ring is broken across its cross section in one place. In double fracture types, both inner and outer rings are broken in two places.

Major advantage of the single fracture construction is that it permits maximum assembly of balls into the races, increasing the capacity of the bearing.

The double fracture ball bearing can be assembled in places where a solid race bearing cannot be used. This type of bearing is essentially a solid race bearing that has been cut in two and then reassembled by holding screws.

• Once a fractured bearing is assembled, it can be treated the same as a solid race bearing.

Split Ballbearing Corp., division of Miniature Precision Bearings Inc., Lebanon, N. H., explains why: To split a bearing, we score the ring (not the race) and expand it in a special machine. The result is a clean fracture at the scored line. Under a microscope, the fractured faces show thousands of metal crystal irregularities which act as dowels in positioning and realigning the faces when they are brought together.

The outer race can be held together at the fracture by a retaining ring, or by pressing the bear-

ing into a housing to prevent spreading under thrust loads.

• Single fractured bearings have increased load carrying capacity.

Relative space and weight savings are possible. A split bearing with a smaller outside diameter and cross section has the same capacity as a larger conventional type.

Maximum capacity is provided with a full ball complement. Minimum torque may be had by using alternate ball construction (alternate balls are undersize and act as spacers). High speeds may be obtained by using solid retainers.

Integral shields that are impossible to use in conventional type bearings can be added to provide built-in shielding and a more rugged cross section with no increase in size.

• Applications of fractured bearings can result in substantial cost savings.

A manufacturer of aircraft hydraulic control pumps was experiencing premature product failure because the margin of capacity of his bearings was too close. Substitution of fractured bearings extended the life of the pump and validated the manufacturer's compact design.

For most applications, overhead trolley wheel conveyors will perform satisfactorily with low cost, conventional bearings. In one case, heavy parts had to be carried that overloaded the capacity of the standard bearings. The first attempt to solve the problem was to use double row ball bearings which were ground. But the designer found that fractured ball bearings with a full complement of unground balls would meet the capacity requirements at a lower cost than the double row ground bearings.

A logical use of the single fracture bearings occurs in situations where the conventional bearing cannot give sufficient capacity within available space. The special bearings are used generally when the only consideration is their extra load carrying capacity, or where the section height of the bearing is so thin that there is no room to put together the two-piece cage required for bearings assembled by eccentric displacement or filling notches.

• The single fracture method offers even greater advantages when used on precision, thin-section bearings.

Example: Split Ballbearing Corp.'s TCR 25-32 size (2 in. OD, 1.5625 in. bore, 0.281 in. wide) can take 34 balls. That's 15 more than found in a conventional bearing of the same size and type. The split bearing has 62 per cent more load capacity and 400 per cent greater life.

• In proper design, double fracture bearings can be replaced without tearing down a machine.

In a compressor where lubrication could not be introduced to the pin on the crank throw, double fractured bearings have been installed with great success. Even though the bearing runs dry, it gives the required life. It would be impossible to install a solid race bearing in such a location. Similar applications are found on pumps.

In many instances, combination of the sealing of the bearing with the outer race has resulted in the development of split ball bearing units that require no housing and serve as pillow blocks.

Coal Thawed by Heat Lamps

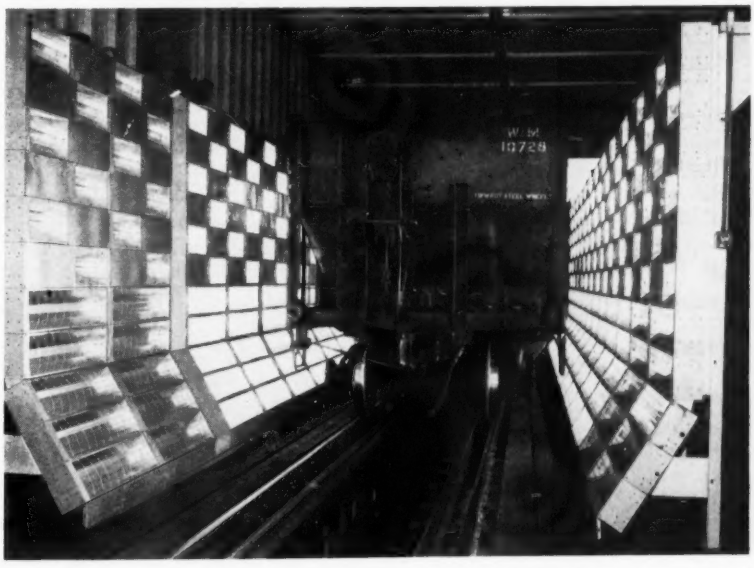
HEAT LAMPS are one answer to next winter's coal unloading problems.

At Western Maryland Railroad Co.'s Baltimore installation, cars enter an oven built by Fostoria Pressed Steel Corp., Fostoria, Ohio, and pass between reflector panels of infrared lamps. Heaviest infrared concentration is at the bottom of the car.

• Baking Time—Some cars must stay in the oven longer than others. Thawing time depends upon temperatures, how solidly the coal is frozen, and the coal's moisture content. Even at zero and below, at least six cars an hour can be unloaded without manual picking.

Western Maryland says the system provides minimum maintenance, greater speed and economy, increased cleanliness, and less damage to railroad cars.

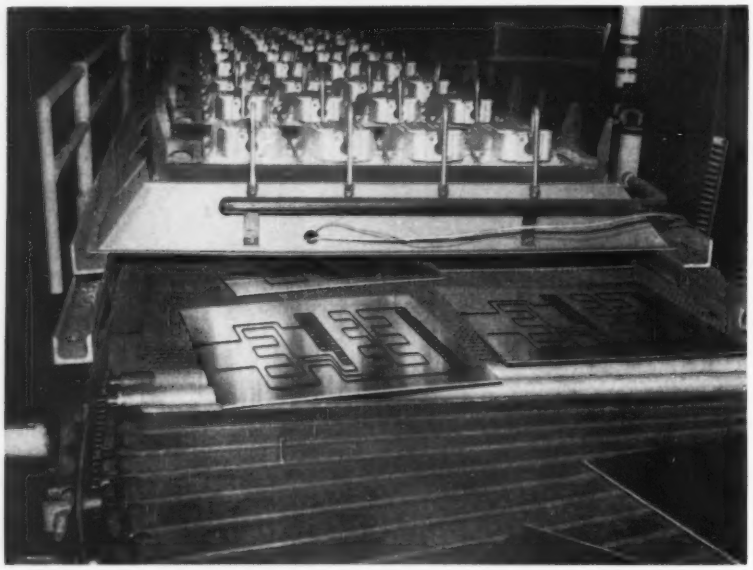
The pencil thin lamps used in this setup are from General Electric Co.'s Lamp Div., Cleveland.



These banks of 1600 and 3800 watt quartz lamps were installed to heat loaded cars, freeing frozen fuel so they could be dumped. Cars were unloaded at a rate of about six an hour in a test last winter

Infrared Heaters Eliminate Tie-up of Drying Conveyor

The gas-fired devices have a ceramic element whose surface reaches 1600° F. Their high efficiency and low fuel costs open up new areas for cutting costs



Bank of infrared heat generators is installed over 22 ft of a conveyor between a printing machine and rolling mill at Reynolds Metals Co. The units dry the metal ink used to print tube patterns on the firm's Tubed Sheet

GAS-FIRED infrared heaters are solving a number of heating problems in industry.

They are being used to preheat metals before brazing or soldering. Manufacturers are using them to dry organic finishes. During the recent floods in Ohio, maintenance men found them to be ideal for drying out electrical motors and other equipment.

Reynolds Metals Co., Louisville, installed the infrared heaters to dry metal ink. The change eliminated a production tie-up and reduced drying costs.

• The heaters (Perfection-Schwank) are the same type used for space heating.

They're made by Perfection Industries, a division of Hupp Corp., Cleveland. When used for heating high-bay building and other hard-to-heat factories, they operate at 100 per cent efficiency. There is no loss in a transfer medium such as air, water, or steam; fuel energy not converted to infrared rays is diffused through space by natural movement of air and gases.

At Reynolds, the units are installed directly over a conveyor line between a printing machine and rolling mill. They're used to dry the metal ink used for printing tube patterns in the company's Tubed Sheet, a sheet aluminum with integral tube circuit. The product is made by printing a reduced size circuit pattern on one sheet and bonding another to it in a rolling mill. Under pressure of the rolls, the sheet and pattern are expanded to four times their original size. The ink prevents bonding of the printed surfaces which are expanded into tube circuits by fluid under pressure.

Because of the high capacity of the gas units (48,000 Btu each) it was possible to install a bank of 480,000 Btu capacity over 22 ft of conveyor. The heaters operate at high efficiency, converting 60 per cent of fuel input into infrared rays of lengths (1.5 to 6 microns) readily absorbed by the metal ink.

• The infrared wave length is generated by an element surface temperature of 1600° F.

The ceramic, invented by German scientist Guenther Schwank and developed into practical heating units in this country by Perfection Industries, is perforated with 200 holes per square inch.

Air drawn from the atmosphere and gas are mixed in a chamber behind the ceramic and passed through the holes. A separate flame burns at each hole. The entire combustion takes place within $\frac{1}{8}$ in. of the ceramic face. The rear surface of the ceramic doesn't exceed 400° F.

Heaters are ignited by a pilot light and protected against escaping gas by a pilot heated thermocouple which closes an electrical solenoid valve if the pilot should fail.

• The heaters cut operating costs and solved the drying problem without revision of the production line.

With about half the drying being done by gas, operating costs are down one-third. Reynolds plans to replace the remainder of the units as they burn out. When the entire line is gas operated, drying cost will be one-sixth that of the original installation. The infrared heaters last indefinitely, requiring only occasional cleaning for maintenance.

The difficulty experienced with the original system was insufficient heat. To remedy the situation would have required more heaters and lengthened conveyor travel, or more powerful heaters. Reynolds obtained the heat it needed by substituting the bank of ten, gas fired heaters for four banks of its original units.

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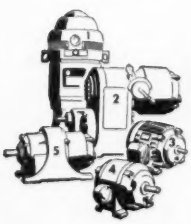

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Reactor Treated Hot Metal Boosts Output of Steel

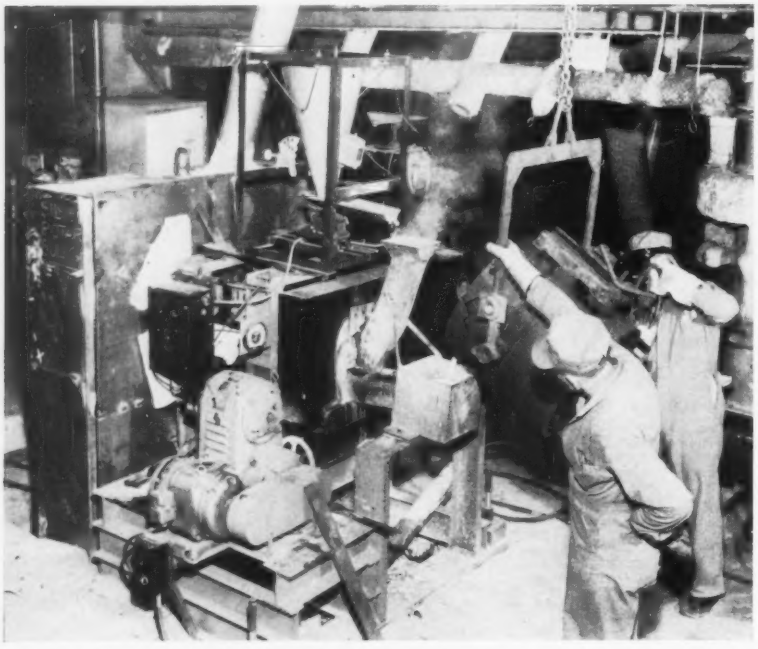
Rotary unit, developed by Diamond Alkali Co., has been in pilot operation over a year. It may boost output as much as 15 per cent for open hearths, 50 per cent for electrics, by removing silicon and sulfur from hot metal. It may be used later to remove other impurities, or add desirable elements. Molten iron, held against the refractory lining by centrifugal force, protects it from the alkali. Fumes are controlled by an exhaust system.

REMOVAL of silicon and sulfur from hot metal before it's put into steelmaking furnaces may boost output of open hearths as much as 15 per cent, electrics as much as 50 per cent.

A new process makes wash metal by treating molten iron with an alkaline material, iron ore, and oxygen, in a rotary reactor. It was developed by Diamond Alkali Co., Cleveland.

• The process is continuous; a rotating cylinder brings the molten metal and treating agents together in a turbulent flow that speeds up reaction.

The rotating cylinder of the reactor is a steel shell, lined with refractory material. It turns fast enough to hold hot metal and alkali against its inner surface with a force of 6 Gs.



In pilot plant, operated at Battelle Memorial Institute, hot metal and alkaline agent are fed into a 10-ton-per-hour rotary reactor

Rotor speed varies with diameter. Cascading of molten metal is minimized, so the alkaline agent can't damage the rotor lining.

Molten metal, alkali, oxygen, and iron ore travel in a spiral path through the rotor, which serves as a metal storing, metal advancing zone. The rotor, hot metal, and treating agents rotate at different speeds. Result: Shearing, or rubbing action. That, with inherent flow characteristics, causes turbulence, so the metal and treating agents constantly present fresh surfaces to each other. Most reactions occur in the rotor.

As the stream of molten metal and alkali leaves the rotor and enters the collection hood, it's broken into small particles, and further reaction takes place. Drops of wash metal are then collected in a continuous stream.

• Treating agents are automatically dispersed over the molten metal.

Various alkaline agents have been used to remove sulfur from hot metal. Most popular: Commercial sodium carbonate (soda ash).

A stronger alkaline material, like caustic soda, does a better job of treating the metal, but precautions must be taken to keep it from attacking the refractory lining of the reacting vessel and to prevent caustic soda fumes from irritating personnel.

In earlier chemical methods, the alkaline material had to be dispersed in the metal bath. It was done by adding it to molten metal in the runner from the furnace, or by adding it to the ladle, then pouring the metal from one ladle to another.

In the rotary reactor, the treating agent doesn't have to be highly dispersed, and it doesn't come into contact with the refractory lining of the unit.

Fumes from caustic soda or other chemical agents which are in contact with molten metal for extended periods lose their offensive properties. They can be disposed of with no hazard to personnel.

• Pilot reactors have been operated

(*Please turn to Page* 122)

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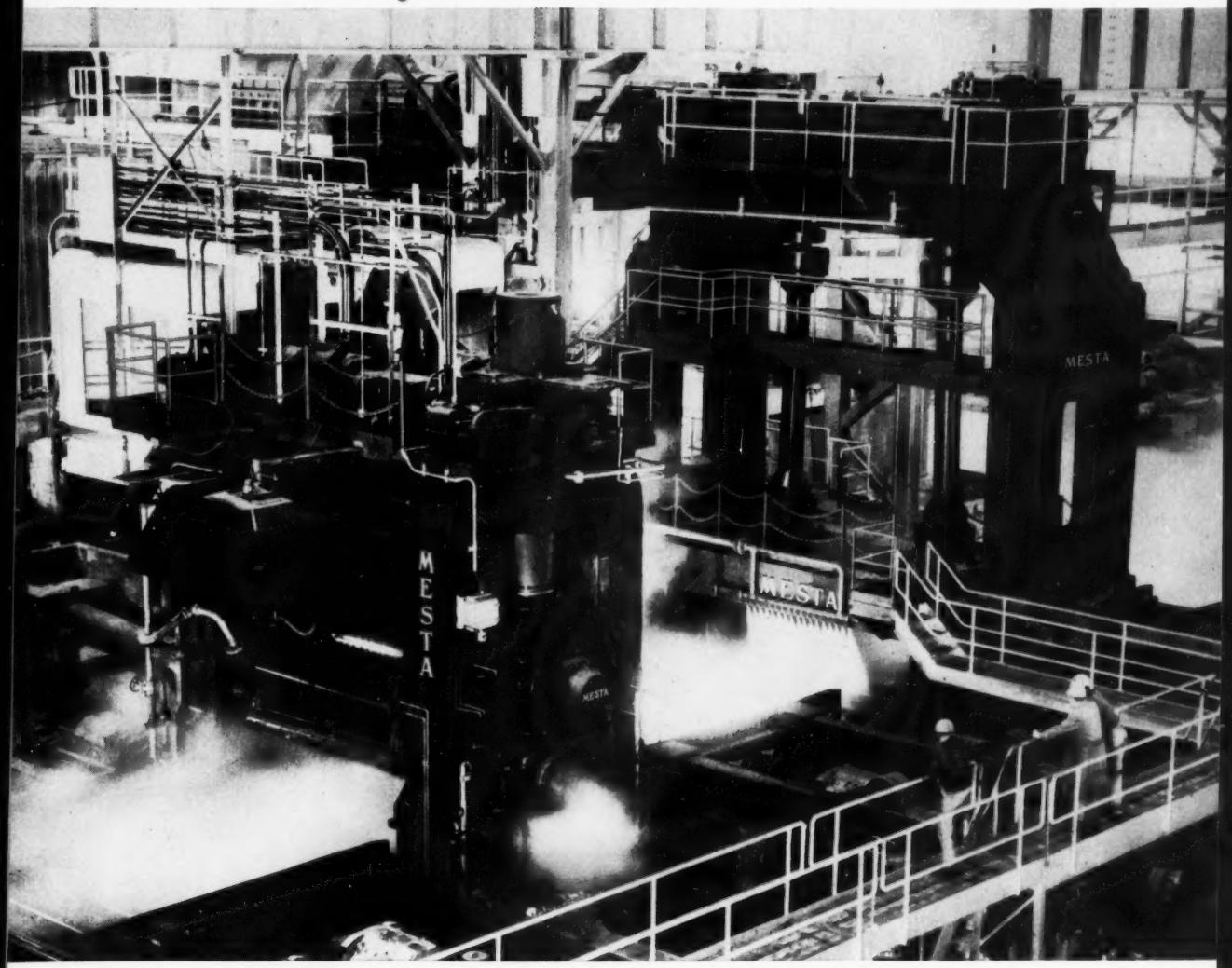
...for LUKENS STEEL COMPANY

COATESVILLE, PA.

At Lukens Steel Company, the 140″ Four-High Reversing Plate Mill and Vertical Edging Mill is an unusual installation. Although this mill will be operated primarily as a slabbing mill to reduce ingots into slabs for rolling plates on other mills, it can complete the rolling of plates to finished sizes directly. The Vertical Edging Mill, largest ever used in tandem with a Plate Mill in this country, provides edge rolling of the ingot which remains in the horizontal position during the complete operation. This installation is the major unit which will increase the plate rolling capacity at Lukens by 40 per cent.



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PITTSBURGH, PENNSYLVANIA

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Average Crucible warehouse stocks these and many other specialty steel items in a tremendous range of sizes and analyses. A single phone call will bring any or all of them to you *in the quantity you need.*

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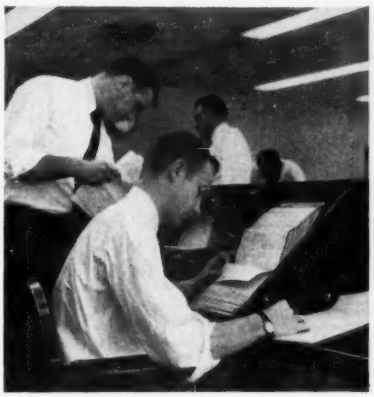
Every day, thousands of specialty steel items flow from Crucible mills to Crucible's 31 strategically located warehouses – keeping local stocks at levels that meet customers' *maximum* needs.

Here's how these continually-replenished stocks are helping one steel buyer today. He says:

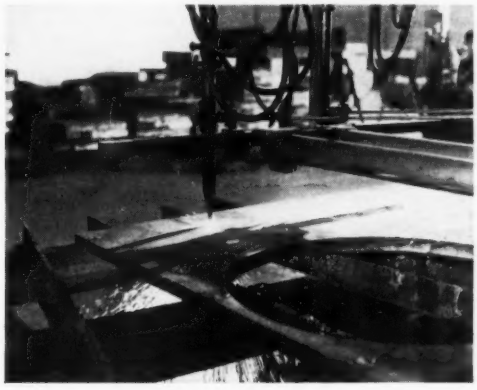
"We reduced plant inventory to cut operating costs and free working capital and space. This is smart business. But it creates problems, too–like when production requisitions an extra-large order of 36" x 120" Type 304 stainless sheet, 20 ga and 2B finish – *and needs it overnight.* I solve this problem by calling the Crucible warehouse. It's set up to give us the kinds of steels we need from stock."

All 31 Crucible warehouses offer in-stock delivery of approximately 16,000 specialty steel items, ranging from tool steels to stainless sheet and wire. They're able to maintain these high inventories because they're part of Crucible's completely integrated operation, from mining the ore to steelmaking to warehouse delivery to you. If you'd like to know all the ways these warehouses can serve you, phone or visit the one near you today. *Crucible Steel Company of America, Dept. PE15, The Oliver Building, Mellon Square, Pittsburgh 22, Pa.*



Inventory specialists keep warehouse stock records up-to-date to give you fast, accurate answers on availability of every analysis.

Steels you ordered yesterday arrive today at your receiving platform — dependably on schedule.



Warehouses maintain modern equipment, like this electronically-controlled flame cutter, for fast processing of specialty items.

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STAINLESS STEELS – Bars, sheet, strip, wire, cold heading wire, metalizing wire, plates, angles

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ALLOY STEELS – Bars, billets, strip and sheet
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PERMANENT MAGNETS
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over a year. Cost of larger production units has been estimated.

Diamond Alkali engineers have operated a 10 ton per hour reactor at Battelle Memorial Institute, Columbus, Ohio, and a 60 ton per hour unit at W. O. Larson Foundry Co., Grafton, Ohio.

The reactor has not yet been applied to partial reduction of iron ore and decarburization of hot metal. It may be used later in those applications. It can reduce sulfur content from 0.044 to less than 0.03 per cent and silicon from 1.27 to 0.40 per cent.

The reactor may be licensed from Diamond Alkali for removal of silicon and sulfur. Some steelmakers or foundry companies may want to develop the unit further for their own special applications.

Costs have been estimated for reactors with capacities up to 150 tons per hour. A capital outlay of about $250,000 is estimated for two, 150 ton units that could operate in parallel. The price includes accessory and associated equipment.

Scrap Handling Quickened By Hoppers in Floor Pit

Here's one way to cut scrap handling and shoveling time. Put collection hoppers in pits. Empty the self-dumping units with a lift truck. It's being done at Greenlee Bros. & Co., Rockford, Ill.

Greenlee uses a four hopper unit in each of its three machining departments. A sign above each hopper marks it for a scrap type.

Scrap is collected from machines, brought to the hopper in wheelbarrows, and dumped. Before the pits were installed, scrap had to be shoveled from the wheelbarrow to the hopper.

Lift trucks use a hook to pull full hoppers out of the pit. After the hook is taken off, the forks are driven under the hopper, which is carried to the outside scrap bin.

The fork lift driver can quickly dump the load by releasing a lock handle on the hopper. It tilts forward to dump and automatically returns and locks upright.

The hoppers are manufactured by Roura Iron Works Inc., Detroit.

Ultrasonic vs. Eddy Current

A wide range of factors affect selection. Some standards are still being studied. One firm spent ten years investigating both methods before it made up its mind. It chose eddy

EDDY CURRENT testing has really paid off for Reading Tube Corp., Reading, Pa.

Products are inspected twice as fast (more than 700 tubes an hour) compared with the former method. Quality is far more reliable since the new device catches invisible flaws and pinholes not turned up previously. Cost: About $5000.

• How it chose method.

Reading Tube took ten years in deciding to invest in an eddy current tester. Franklin S. Catlin of Magnaflux Corp., Chicago (the supplier) points out some of the reasons why Reading took so long. He says the best test for a particular type of tube depends on sensitivity required, acceptance and rejection standards, and defect sizes. In many cases, such standards have not been established.

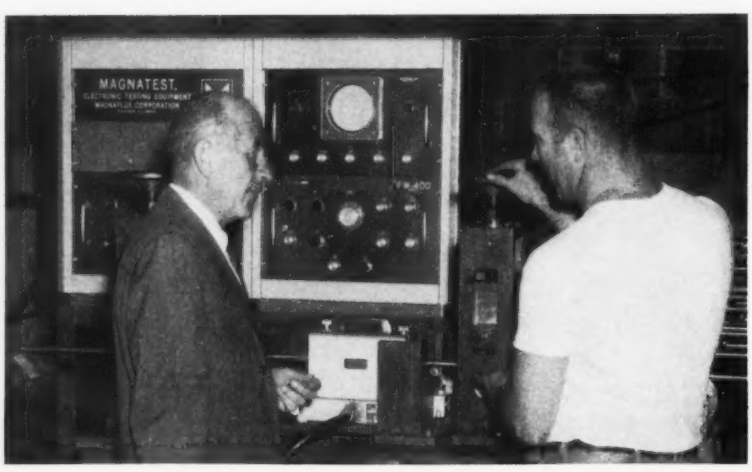
Several nondestructive tests are used to test tubing—including ultrasonic, magnetic current, fluorescent and dye penetrants. For example, theoretically penetrants can detect any open defect no matter how small. Both eddy currents and ultrasonics have practical lower limits.

• Critical applications require several tests.

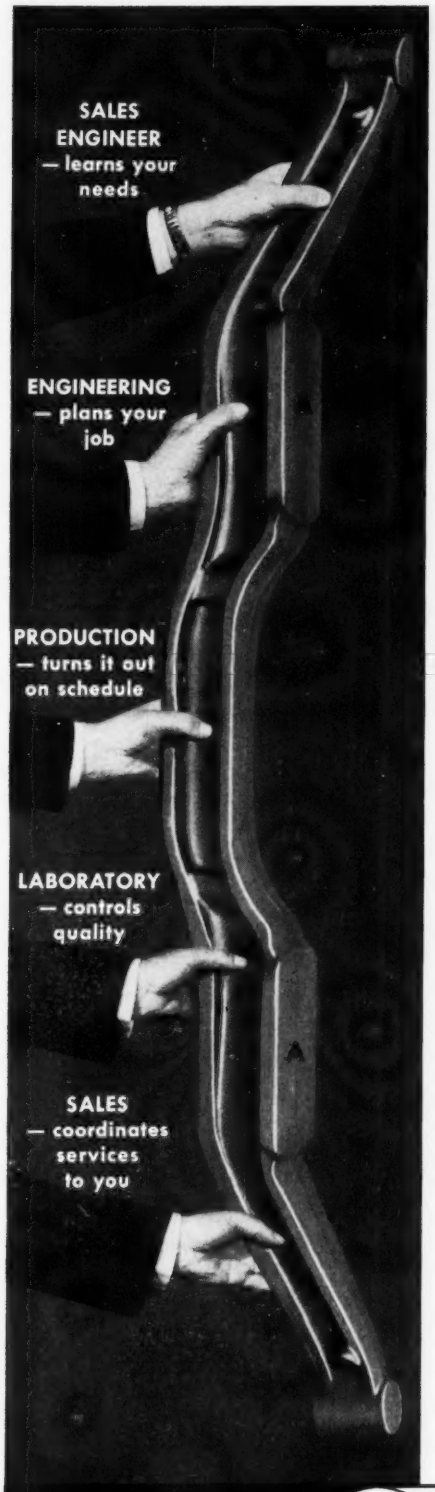
Most evaluation programs for the several testing methods are not yet complete, says Magnaflux. But high quality tubing, such as that used for nuclear reactors, can be tested by two or more methods. In some cases, all methods are used.

Sensitivity varies with equipment. Outside coils on tubing for eddy current tests compare favorably with ultrasonics on the outside diameter but are less sensitive than ultrasonics applied on the inside, says Mr. Catlin. He also points out that eddy currents with both internal and external coils are superior to ultrasonics although scanning the tube twice using different angles for the ultrasonic beams is equally sensitive. Speed, however, is cut in half.

In general, eddy current testers operate at 320 fpm, compared with 45 or 50 fpm for ultrasonics.



Operator is adjusting feed roll of new eddy current tester which detects flaws in tubes traveling at 320 fpm. The unit doubled inspection rate for Reading Tube


SALES ENGINEER — learns your needs
ENGINEERING — plans your job
PRODUCTION — turns it out on schedule
LABORATORY — controls quality
SALES — coordinates services to you

IT'S A TEAM AT T&W

that gives you the part you need

When you buy forgings or stampings from T&W, an entire team swings into action. These experts make sure you get what you need on time. This coordinated teamwork is a part of *T & W Technique* which gives you forgings and stampings which usually cost you less at your point of assembly.

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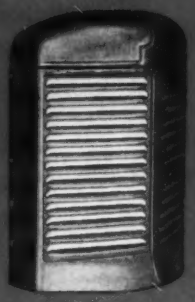
On the 70-inch axle shown at left, *T & W Technique* helped to meet these requirements: The overall length tolerance is held to 1/8-inch; there is no draft on the upper and lower surfaces of the spring pads (A); tops of the spring pads are parallel within 1/16-inch; knuckle pin bosses are in vertical alignment within 1/32-inch.



DEEP DRAWN STAMPINGS like this radiator grill are produced by T & W's Stamping Division. Stampings requiring draws up to 16 inches are produced in sizes up to 60 inches long by 40 inches wide.

Write for 20-page book, "Transue & Williams Challenges the Future" explaining how T & W Technique produces forgings & stampings that cost you less at your point of assembly.

FORGINGS & DEEP DRAWN STAMPINGS

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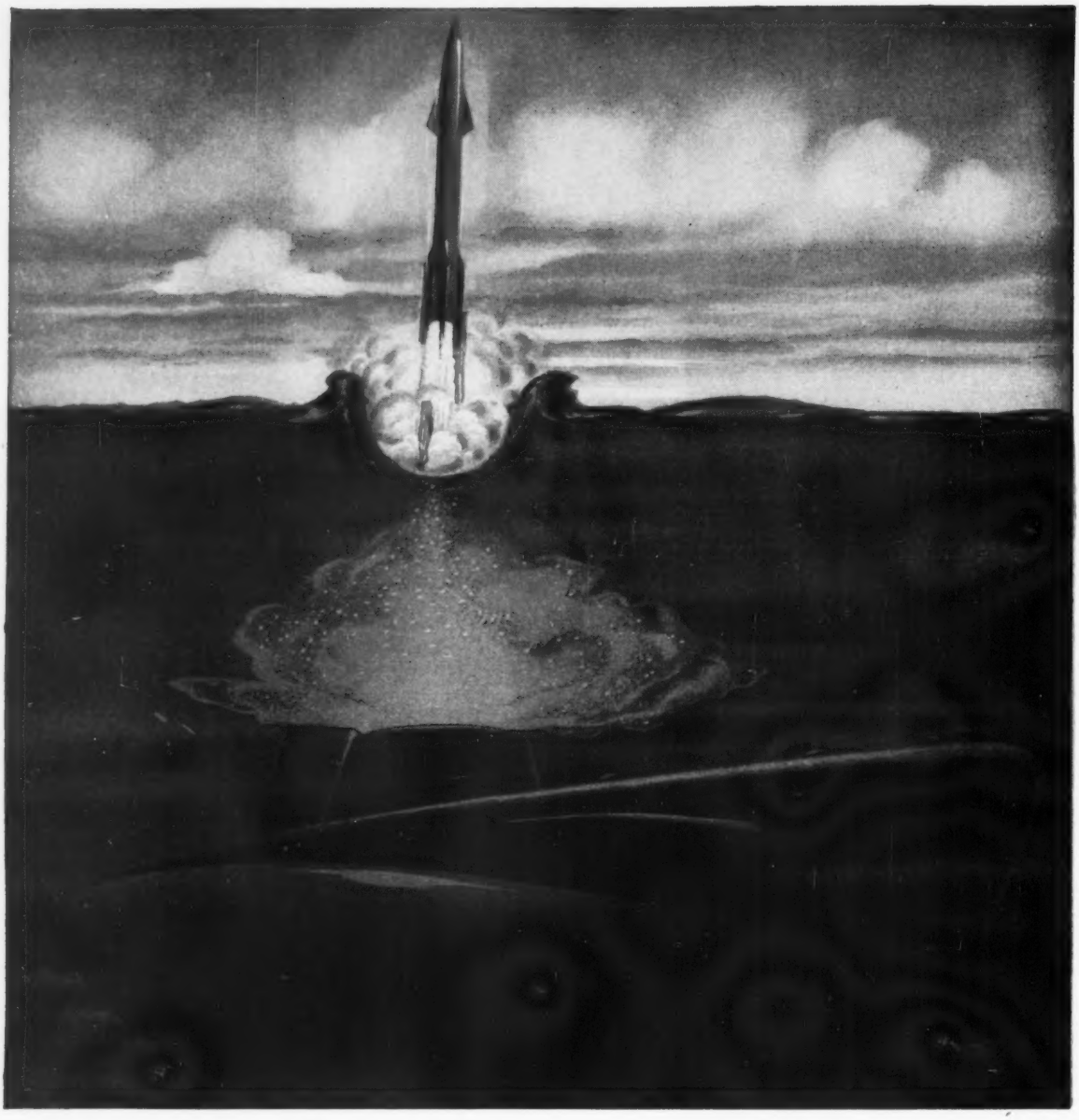


Underwater weapon . . . with wings!

A major American weapon is shaping up in the U.S. Navy. It's the *Polaris*—a new guided-missile system designed for underwater firing from a nuclear-powered submarine. These mobile, elusive launching sites make defense against Polaris practically impossible.

The heart of this deadly weapon is a complex guidance and fire-control system, now under joint development by the Navy and private industry. Without rugged, reliable electrical insulations, such as those CDF supplies, these intricate electronic controls simply wouldn't work.

CDF, a subsidiary of The Budd Company, has pioneered dependable electrical insulations for over sixty years. You'll find CDF products almost everywhere—in the aircraft, automotive, communications, and railway fields, to name a few.

Have you a "problem product"—one that CDF insulation could improve? See Sweet's Product Design File and other directories for the name and phone number of your CDF sales engineer. Send your print or your problem; we'll return pertinent technical literature and recommendations.

CDF CONTINENTAL-DIAMOND FIBRE

A SUBSIDIARY OF THE Budd COMPANY • NEWARK 85, DEL

Pickling Basket Life Upped 25 Times by Stainless

Pickling basket life was increased 25 times by a switch to stainless steel at Zallea Bros., Wilmington, Del. When the baskets were installed in 1956, expected life was seven years—a goal that may be surpassed.

The baskets are in a pickling tank about 4 hours a day. Maintenance problems are so low that the company sees no reason to keep spares.

Previously used equipment lasted six months before extensive repairs were required. Further repair and maintenance were required at four to six week intervals.

The baskets were frequently damaged in handling. The coating would wear and expose the structure to acid attack. Trapped acid under the ragged areas of the coating caused more corrosion.

• **Operation**—Stainless steel expansion joints and other assemblies are carried through pickling or passivating baths following annealing. A hot sulfuric acid pickle, followed by a cold hydrofluoric-nitric pickle, removes annealing scale and passivates the surface. If scale removal is unnecessary, a nitric acid passivating treatment is used.

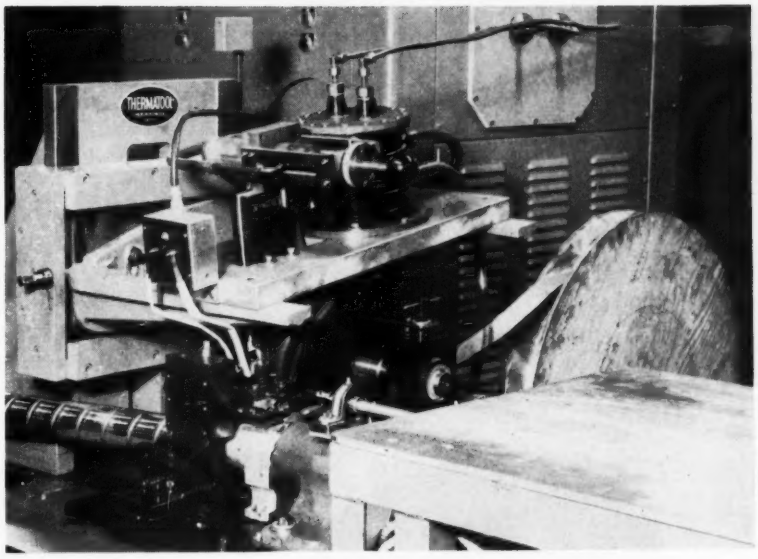
The baskets were designed by Zallea Bros. and Cambridge Wire Cloth Co., Cambridge, Md. They were fabricated at the Cambridge plant.

New Vinyl Finish Resists Many Stains

A new, nonstaining finish on a vinyl metal laminate (called Colovin) is said to resist such stains as iodine, gentian violet, and ballpoint ink. It's a product of Columbus Coated Fabrics Corp., Columbus, Ohio.

Although the finish was developed primarily for use with white Colovin vinyl, it is available in other colors and textures. The material can be laminated to steel, aluminum, and other metals.

The company thinks the finish will be of particular significance to the appliance industry.



Strip enters forming rolls from right. V-shaped edges pass between sliding contacts which deliver 450,000 cycle current. It joins 1000 ft of strip a minute

High Frequency Tube Welder Proves Efficiency

A TUBE MILL less than one-fifth as large as conventional machines is demonstrating the unusual potential of high frequency resistance welding.

The maker, New Rochelle Tool Corp., New Rochelle, N. Y., says the new device can weld 0.004 in. strip at 1000 fpm. Two semiskilled operators can make forge welds, lap, mash seam, or butt edge welds with an exceptionally small bead.

• **The idea is to make tubing in a spiral.**

Using tin plate stock, the little mill can turn out 3 in. tubing at a 150 fpm clip (you can increase speed by increasing power). The machine is on a waist high platform. A motor drive takes strip from a coil, puts it through forming rolls to a set diameter, and delivers an open seam to the welding head. The number of spirals per foot of tubing can be adjusted (the more spirals, the greater the stiffness).

The edges of the metal are formed into an open vee which moves between two sliding contacts which deliver welding current.

• **The principle concentrates heat at the right point.**

High frequency current (450,000 cycles per second) makes current travel the long way around. Unlike ordinary direct or low frequency current, which follows the path of least resistance, this type looks for the path of least inductance (a coil of wire has inductance). That is the path from one sliding contact to the lap joint and back to the other sliding contact. Result: All the heat is concentrated at the weld. You need less power, and you get faster welds. In addition, the heat affected area is much narrower, a good feature in stainless and some nonferrous metals.

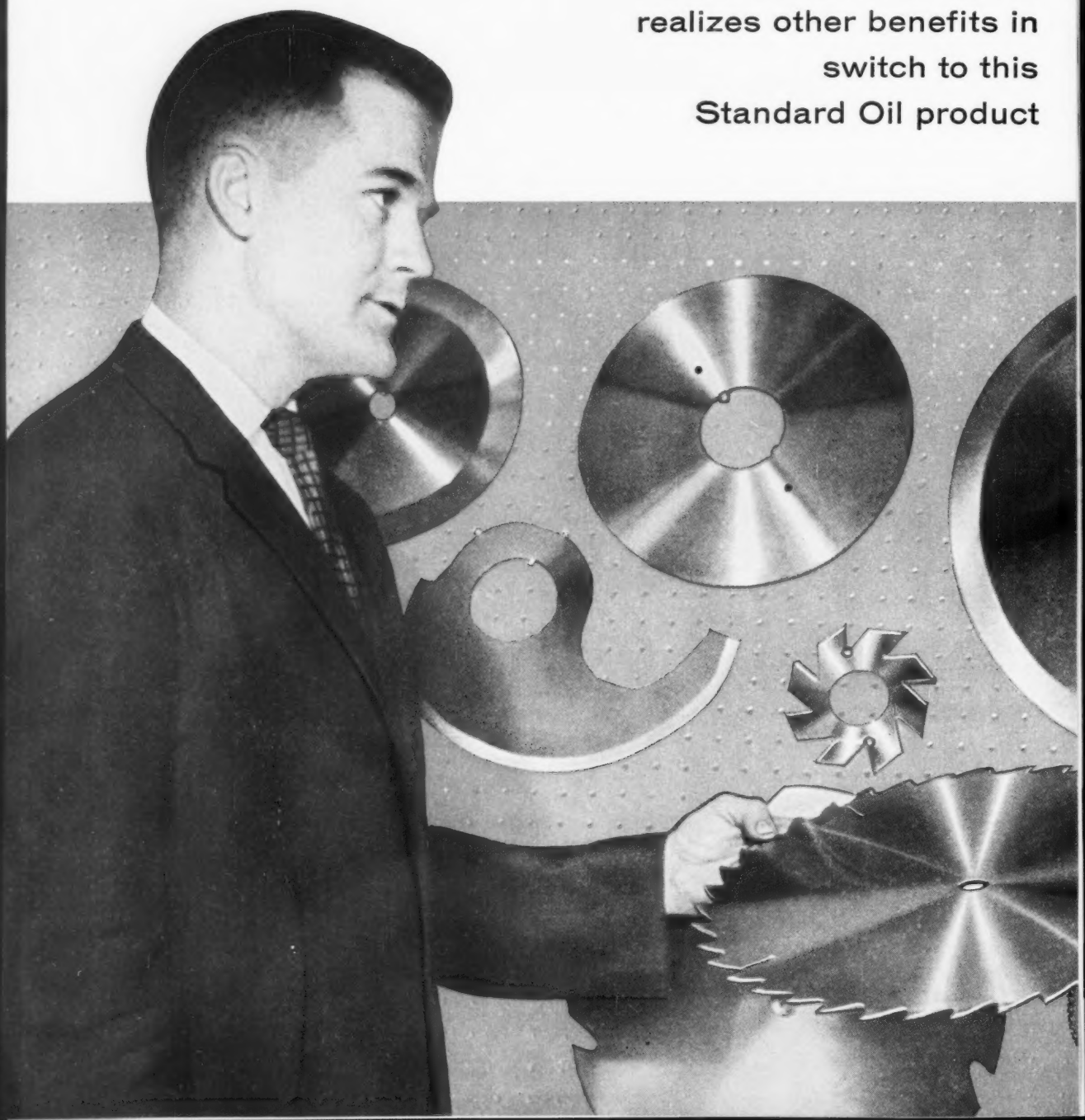
New Rochelle says the machine can join tubes from 1½ in. in diameter up to any practical size (10 ft or greater). Refinements are expected to make smaller sizes possible.

Gets 40% savings in coolant costs by change to

Standard's Transparent Coolant

ARGON Oil No. 4

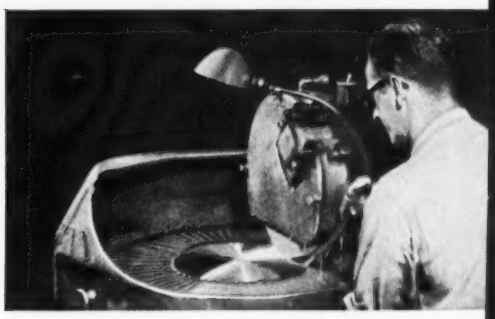
Chicago Saws, Inc.,
realizes other benefits in
switch to this
Standard Oil product



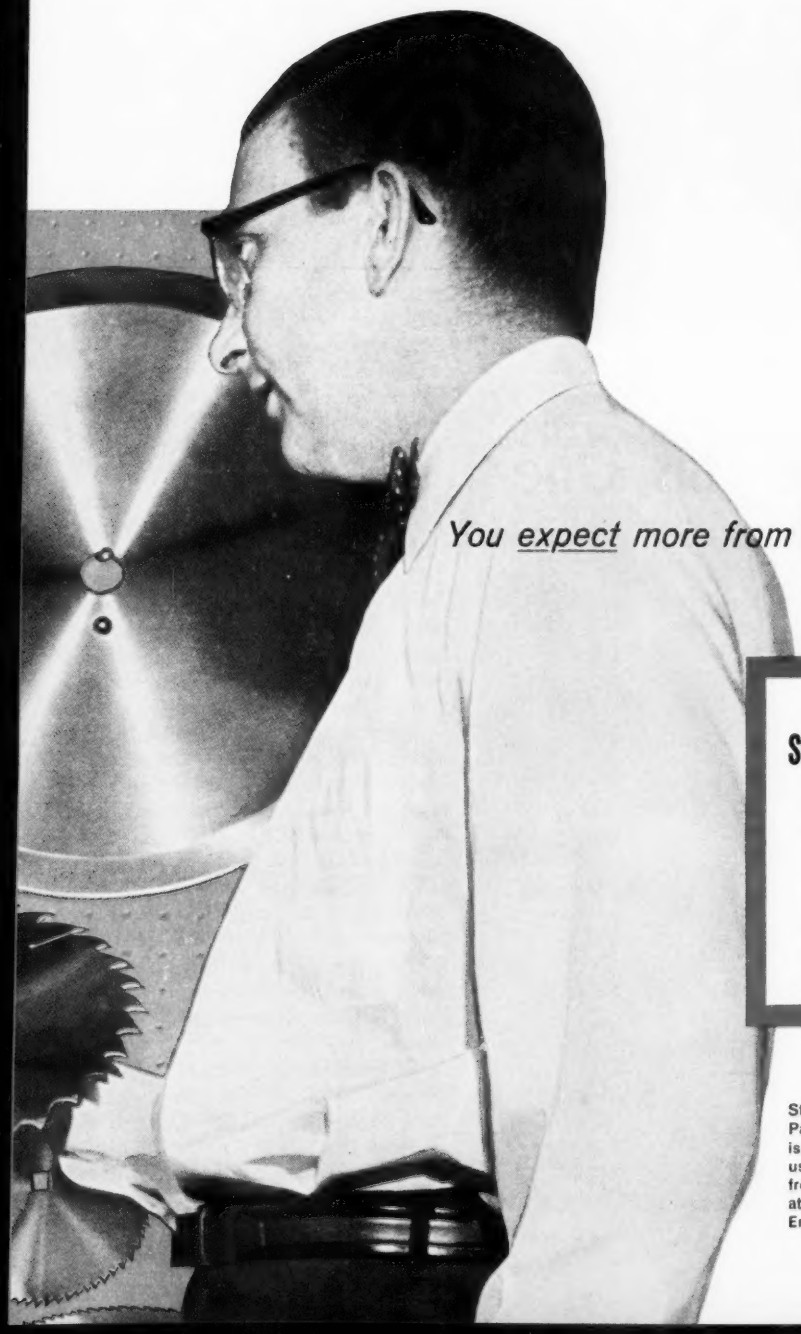
Situation: It all started when a Standard Oil lubrication specialist recommended ARGON Oil No. 4, Standard's transparent coolant to Chicago Saws for use in their grinding operations. This manufacturer of rotary saw blades decided to give it a try. They knew the product was the result of more than three years' work in Standard's research laboratory, and that it had been extensively field tested.

What happened: Using ARGON Oil No. 4 in 100:1 concentration, Chicago Saws was able to reduce coolant costs 40%. They also found the work could be seen more clearly when using this coolant. There was less wheel loading. They also discovered the coolant didn't foam and that its exceptional ability to carry off heat resulted in cooler operation. Faster cuts were obtained with finer wheels. Tolerances were easier to hold. Better finishes were obtained. Wheel dressings were less frequent.

What you can do: Get more information about ARGON Oil No. 4 transparent coolant. Call the Standard Oil lubrication specialist near you in any of the 15 Midwest or Rocky Mountain states. Or write: **Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Ill.**



Using ARGON Oil No. 4, Chicago Saws gets better finish at savings of 40% over other coolants tried. Operator is using .004" cut on heat treated Rockwell 60 C steel.



You expect more from **STANDARD** *and you get it!*

Quick facts about

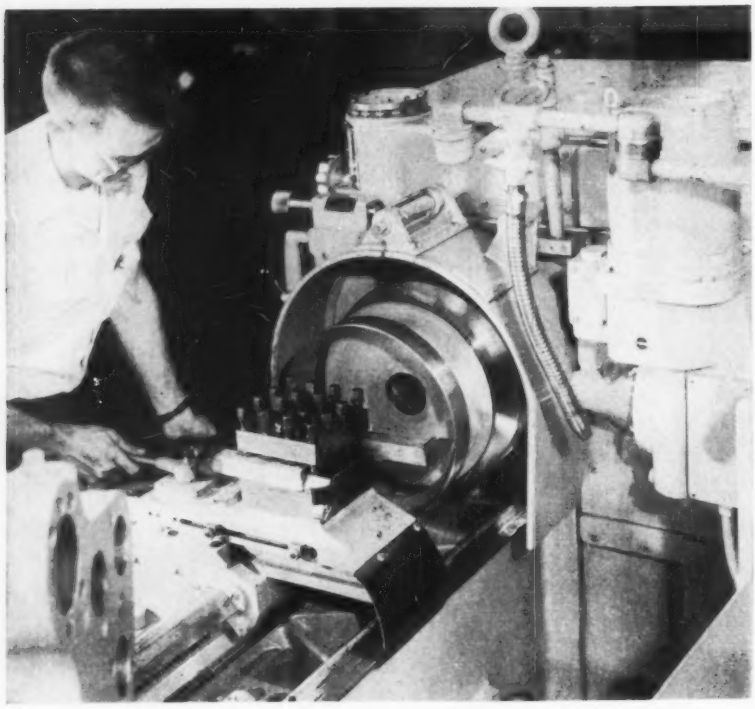
Standard's Transparent Coolant

ARGON Oil No. 4

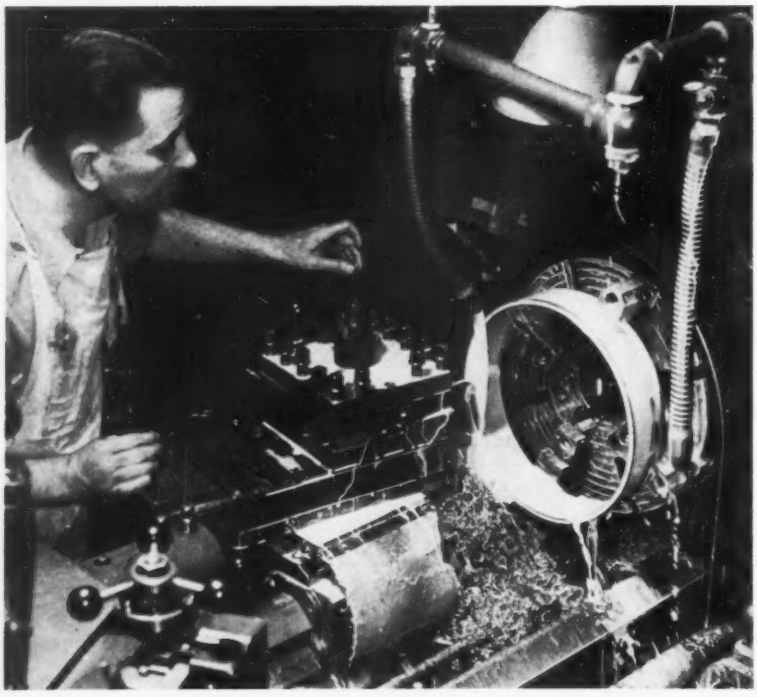
- Clear, transparent fluid
- All chemical. Does not support bacteria growth
- Unaffected by humidity
- Nonfoaming
- Fire resistant
- Odorless

Standard's Bob Stark and Chicago Saws' vice president Paul Bostrom discuss blades and coolants. Bob Stark is well qualified to work with manufacturers on the use of metalworking coolants. Bob has a chemistry degree from Illinois College plus three years' experience at Standard. He has completed the Standard Oil Sales Engineering School course.

Ten Machines Like This One . . .



Replaced 14 Like This One



ASKING operators to run both old and new machines is like asking a golf pro to use an unmatched set of clubs.

Such reasoning prompted supervisors to replace all 14 turret lathes at the Canning Machine Div., Food Machinery & Chemical Corp., Hoopeston, Ill.

Over-all results: Direct labor costs were cut; scrap losses were trimmed; and savings in both downtime and maintenance were appreciable.

Jack Stevenson, plant industrial engineer, figures the ten new Warner & Swasey machines will pay for themselves in less than five years.

• Problems centered on machines that were both old and unsuited to a new product line.

The turret lathe department was made up of 14 ram and saddle machines: Eight ram types, averaging 16 years old; and six saddle types, averaging 19 years. The age and generally poor condition of the machines were the prime factors in getting a study of turret lathe replacement underway. The study was complicated by the fact that since the company's product is special machinery, previous production data couldn't be used for a point-by-point comparison.

Added to that complication, about 80 per cent of the firm's products were developed within the last ten years—since the machines were purchased.

Augmented by a study of machine speeds and feeds of newer equipment, the engineering survey showed:

1. The company's machines didn't have the speed or power to take full advantage of modern carbides.

2. Machine sizes were larger than needed, meaning that small work had to be run on heavy, hard to handle equipment.

3. Because of the poor condition of machines, operators had to hold

back on depth of cut to get the size tolerances and surface finishes specified.

• Management's decision: Replace all the machines with new ones to get consistently high quality work.

Instead of replacing one or two machines a year, management figured it could cash in on extra benefits by having all machines capable of the same performance levels. They reasoned: Since production had little pattern to it, operators had to be moved from machine to machine; the presence of old machines in the department would have a tendency to offset the cutting rates of new machines.

It also seemed logical that it would be easier to get the operators used to higher feeds and speeds on the new machines if the old ones were gone. The new machines would take the greater cutting rates with ease and quiet; the old ones vibrated and chattered.

• The first machines to go were the eight ram types.

Early in 1957, four No. 3s, one No. 4, and three No. 5s were replaced with two No. 1 Electro-Cycles, two No. 3 Electro-Cycles, and one No. 4. The ½-in. reduction in average spindle size made the machines more compatible with the work; the new machines had the horsepower and speed to permit working at 600 surface feet a minute with normal feeds on free machining steel and 350 sfpm on stainless vs. about 200 and 150 for comparable materials with the old machines.

In the first year, the machines cut direct labor costs better than 30 per cent, and scrap losses were slashed. Although the savings were satisfactory, Mr. Stevenson says they felt sure the savings would grow as operators became more familiar with the new machines and their capabilities. Based only on the first year of operation, the five new machines showed a payoff period of considerably less than five years.

• The ram type replacement success story led to the replacement of saddle type machines.

Shortly after the ram type machines were installed, the six old saddle types (two 2-As and four 1-As) were sold and replaced with three new No. 5s and two 2-As. The five machines cropped direct labor costs; scrap loss was slashed; and downtime and maintenance costs fell. The machines showed a payoff period of less than five years.

• The new machines also have resulted in a bonus in capacity.

Although the department has fewer machines (10 instead of 14), an effective increase in lathe capacity permitted the company to gain 1000 extra hours. Used to take up slack periods, it eliminated the need for laying off three men and precluded the rehiring and training expense that would be met when the slack period ended.

Welder Whips Fitup Problem

Detroit firm combines cam control with a probe coupled to magnetic tape to guide welding heads. Scheme overcomes deviations up to ⅜ in.

POOR FITUPS aren't as much of a problem in welding as they used to be. Several makers of welding machines have systems that automatically compensate for gaps, deviations in dimension, and warping.

Example: Expert Welding Div., Expert Tool & Die Co., Detroit, has a system which uses magnetic tape and a tracer to overcome the problems. Self-powered welding heads accurately follow contours like those on automobile chassis frames.

• A loop of magnetic tape stores deviation data reported by a mechanical probe.

As the welding carriage moves, a sensing finger or probe follows the weld contour. Its movements are transmitted to a differential device which electrically presents deviations from the design to a magnetic tape for storage.

A few inches behind the recording head, a pickup feeds the information from the magnetic tape into the positioning equipment for the welding head.

The probe is put ahead of the welding head to keep spatter off the probe. The distance between head and probe is the same as that between recording and reading heads on the magnetic tapes. A loop of tape rather than a conventional spool eliminates rewinding.

Although CO_2 shielding is used, the system works with all other types of arcwelding.

• Heads are guided by cams in a new frame side rail welder.

The driving and guiding mechanism for the welding heads are mounted on the top or crown part of the machine. Each head has its own carriage, separately driven through a rack and pinion. Each has its own rollers which follow cams made to print dimensions. Horizontal guidance is entirely by cam; vertical operation is modified by the tape tracing system.

Bronze clamps hold the parts to a platen. Air-operated, they apply pressure along the whole side of the parts. They are adjustable.

• The machine automatically positions side rail halves.

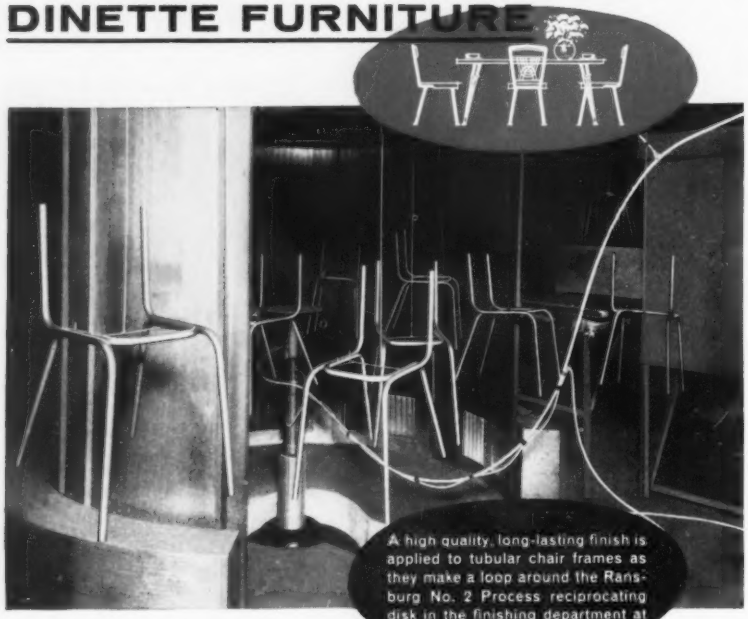
To start the operation, an operator loads right and left halves of a 12 ft side member. The air clamps press the parts together for welding. A transfer mechanism carries the part to the welding position and to an unload station equipped with hydraulic walking beam transfer.

With the platens in position and side rails clamped, six welding heads move into place to weld the entire length (two seams). When welds are completed, the machine cycles itself for the next part.

Crossmember channel halves are welded the same way in a similar machine which has only four welding heads, two for each side. Controls are cam programed, modified with magnetic tape as in the larger version.

RANSBURG *Electro-Spray...*

PROVIDES 50% PAINT SAVING (over the former dip method) in the finishing of KAY-MAR DINETTE FURNITURE



A high quality, long-lasting finish is applied to tubular chair frames as they make a loop around the Ransburg No. 2 Process reciprocating disk in the finishing department at Kay-Mar Industries.

● Kay-Mar Industries, Cassopolis, Michigan, switched from the dip method to Ransburg Electrostatic Spray Painting because they wanted to improve the quality of the finish on their metal furniture line.

Now, with electrostatic spray painting, they get a heavier, more uniform application, which was not possible with former dip. With electrostatic, they are able to use metallic coatings with higher metal content. In their magazine advertising to the mobile home industry, they proudly say: "Finest finish in the industry at no additional cost to you!"

Electrostatic provides other advantages at Kay-Mar. They picked up some additional—and much needed—floor space when dip tanks were removed. Their insurance rates were reduced because of improved "housekeeping" conditions. Frequent color changes are made quickly and simply, and rejects—which used to run 1½%—are reduced to less than a quarter of one per cent.

NO REASON WHY YOU CAN'T DO IT, TOO!

Let us test prove the advantages of automatic electrostatic spray painting on your products in our complete laboratories. No obligation. Call or write for our No. 2 Process brochure, which shows a variety of automatic painting installations on a wide variety of products. Or, if your production doesn't justify automatic painting, let us tell you about the new Ransburg No. 2 Process electrostatic hand gun, now widely used by both large and small manufacturers.

RANSBURG

RANSBURG
Electro-Coating Corp.
Box-23122, Indianapolis 23, Indiana

Drilled, Tapped Holes Give Better Service, Lower Cost

Cost saving and product improvement went hand in hand when drilling and tapping outperformed more costly methods of producing setscrew holes in molded polyester parts.

The parts are two dielectric body castings (9 x 7 x 2 in.) with a ⅞ in. wall which girdles and clamps the heavy duty welding powerpack made by Kirkof Mfg. Corp., Grand Rapids, Mich.

The clamped and girdled package of copper extrusions, castings, and winding sustains drastic heat liberations. At each welding shot (up to 1000 per hour), the copper contorts and sufficient heat is generated to melt the unit. (Water is pumped through the cored secondary.)

Eight ¼ in., No. 20 setscrews are used.

Drilled and tapped setscrew holes were chosen for their firm holding power. Other methods produced too sleek a surface, cost more, or could possibly let setscrews back out under jolting in prolonged service and cycling heats of high current surge.

• **Material Part of Secret**—The low pressure, reinforced molding compound helped make the operation a success. Called Thermaflow (by Atlas Powder Co., Wilmington, Del.), it's loaded with glass fibers and fillers to add strength and structure.

The fiber ends and filler grains are exposed by the cutting action of the tap. They grip screw threads in assembly and give maximum insurance against loosening under vibration in service.

Another design tip involves a drilled rather than cored hole in the corner of the mold. The purpose was to make it easier for the Thermaflow to flow evenly into the corner of the mold.

The reinforced polyester doesn't have to surround a pin in the mold and rejoin on the opposite side in tight quarters, as it would if this hole were cast. Drilling is preferred over molding to get strength at the corner of the part.

The hole accommodates a tierod.

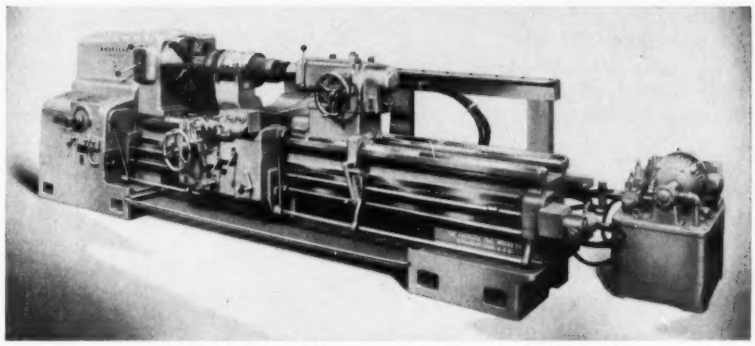
Lathe Contours Shaped Rolls Automatically

ACCURATE contour machining of shaped rolls up to 33 in. in diameter can be done on this new hydraulic duplicating lathe.

The machine has a template-controlled hydraulic duplicating mechanism and 90 degree tool slide that handles all roll tracing work. Carriage feed is continuous, with the rate of feed automatically and steplessly varied (modulated) as the steepness of the contour varies.

Feed rate ranges from zero on a 90 degree shoulder to the maximum preset by the operator for a straight diameter. Result: A stepless generation of the contours on the roll. Final finishing or touching up are not necessary. Expensive form tools are eliminated.

The machine may be instantly converted to standard engine lathe



operation by switching a conveniently located lever at the head end. The tool rest permits mounting a full length support under the extended tools which must be used when the grooves in the roll are deep.

The roll duplicating lathe uses the latest American de Luxe Model Pacemaker Lathe as the basic machine with the hydraulic duplicating equipment built in to form a packaged unit.

For more information, *write* American Tool Works Co., Pearl Street, Cincinnati 2, Ohio.

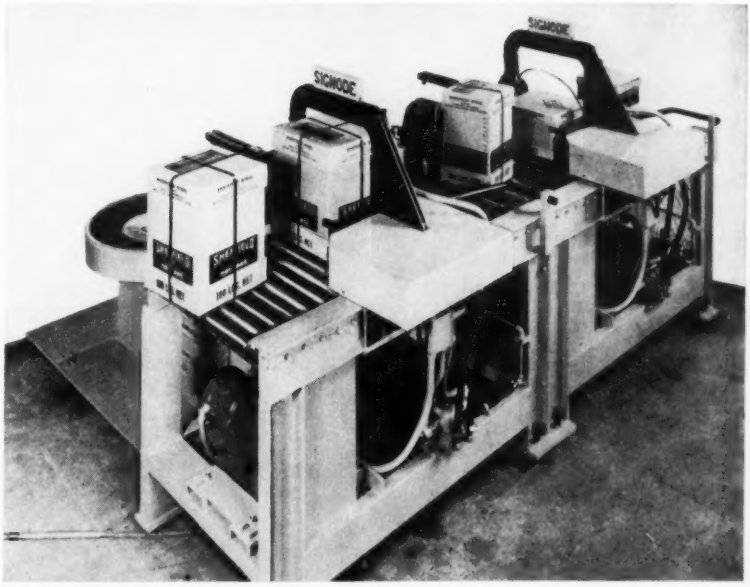
Strapper Handles Bundles of Any Size

THERE is no limitation on the shape, size, or firmness of bundles or packages that may be strapped with the Signode Model M20 Series power strapping machine.

Available in semiautomatic or automatic operations, the machines have straight mechanical design, with power supplied by standard electric motors. The service and maintenance complications of hydraulic or pneumatic power control systems are avoided.

An unlimited strap chute size and strap takeup accommodate all sizes of containers. Stepless adjustment of strap tension from 50 lb minimum to maximum tensile strength of the strap is possible. Maximum tension with a 3 horsepower motor is 1600 lb.

Strap tension is applied smoothly without impact, regardless of the



stiffness or hardness of the bundle, permitting light gage strap to be applied to bundles with sharp corners.

The machine may be mounted in any position. Straps may be applied vertically or horizontally. Several machines may be ganged, so that multiple straps may be applied automatically and simultaneously to a single package.

For more information, *write* Signode Steel Strapping Co., 2600 N. Western Ave., Chicago 47, Ill.

Tool Drills, Finishes

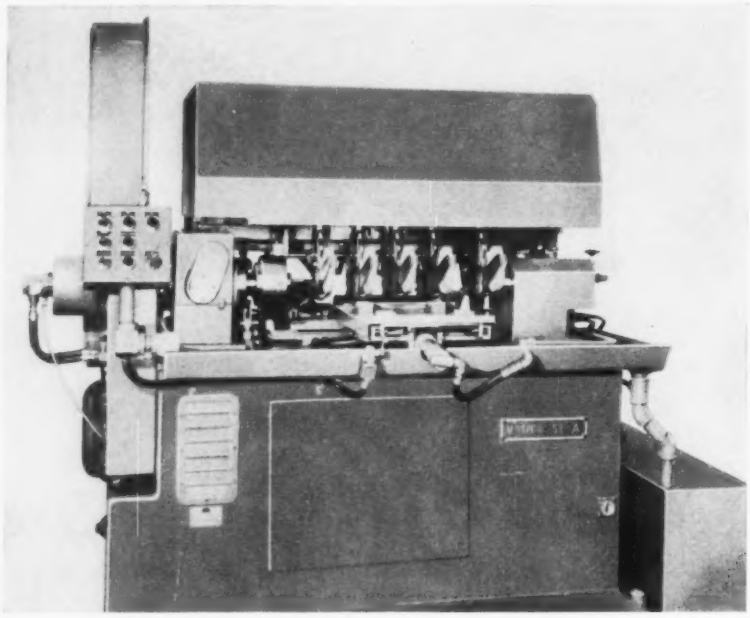
SIMULTANEOUS drilling and finishing holes to size in one pass is an advantage provided by a new Clark tool which combines a replaceable spade drill with an adjustable reaming cutter.

The tool is especially designed for use on thick plate for rapid production of large diameter holes to close tolerances and with excellent finish. The adjustable cutter is of the floating finishing type, the blades expanding and locking to desired dimension. They are mounted in the bar with a cam-lock design which

permits a lateral float to the cutter. This enables the cutter to center itself to the hole, insuring extremely smooth, chatterfree finishing.

The spade drill is furnished in M-3 high speed steel for maximum life in tough, hard to machine steels. The floating finishing cutters are available either in M-3 high speed steel, or carbide tipped.

For more information, *write* Robert H. Clark Co., 9330 Santa Monica Blvd., Beverly Hills, Calif.



Automatic Machine Burnishes Shafts

LAPPING or roll burnishing of bearing surfaces on straightshafts or camshafts can be done automatically on the Footburt-Schraner Model SFA machine. It will handle shafts up to 36 in. long with a maximum outside diameter of 12 in.

In production, the Model SFA can finish all bearing diameters on straightshafts at up to 250 pieces per hour (80 per cent efficiency). On camshafts, typical production for lapping cam lobes and bearings is up to 80 pieces an hour at 80 per cent efficiency. Roll burnishing of bearing diameters on straightshafts or camshafts is done at rates up to 150 pieces an hour.

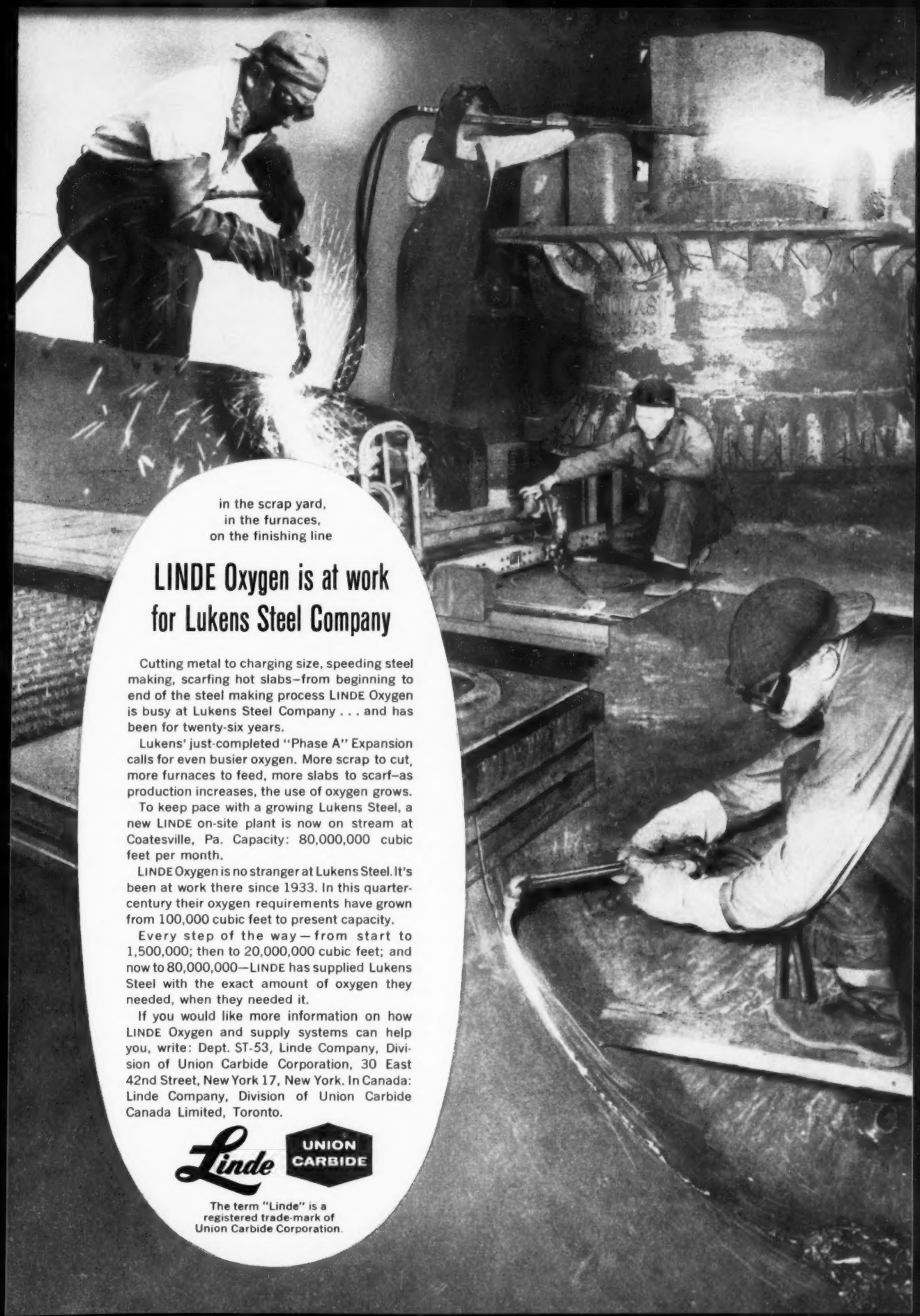
The machine uses rolls of coated abrasive cloth as the finishing medium. A single roll of lapping cloth will usually finish 1000 to 1500 pieces when used on bearings, or twice as many pieces if used on cam lobes. Fresh cloth is fed automatically into the lapping heads as they move away from a finished part. A 5 to 7 microinch rms finish is obtained on parts which have been finish ground or precision turned to at least a 40 microinch rms finish.

For more information, *write* Foote-Burt Co., Cleveland 8, Ohio.

Punch Press Features Rapid Change Tooling

FAST hole punching in angles, channels, extrusions, and sheets is possible with the Model 1012 Unipunch press. Equipped with precision gaging and tooling, the press provides rapid interchangeability of punches and dies for various hole diameters.

In addition to punching round and shaped holes, and notching corners and edges, the press may be used for punching extruded and countersunk holes, small louvers, and lanced holes. Small die sets may be installed for making stamp-



in the scrap yard,
in the furnaces,
on the finishing line

LINDE Oxygen is at work for Lukens Steel Company

Cutting metal to charging size, speeding steel making, scarfing hot slabs–from beginning to end of the steel making process LINDE Oxygen is busy at Lukens Steel Company . . . and has been for twenty-six years.

Lukens' just-completed "Phase A" Expansion calls for even busier oxygen. More scrap to cut, more furnaces to feed, more slabs to scarf–as production increases, the use of oxygen grows.

To keep pace with a growing Lukens Steel, a new LINDE on-site plant is now on stream at Coatesville, Pa. Capacity: 80,000,000 cubic feet per month.

LINDE Oxygen is no stranger at Lukens Steel. It's been at work there since 1933. In this quarter-century their oxygen requirements have grown from 100,000 cubic feet to present capacity.

Every step of the way—from start to 1,500,000; then to 20,000,000 cubic feet; and now to 80,000,000—LINDE has supplied Lukens Steel with the exact amount of oxygen they needed, when they needed it.

If you would like more information on how LINDE Oxygen and supply systems can help you, write: Dept. ST-53, Linde Company, Division of Union Carbide Corporation, 30 East 42nd Street, New York 17, New York. In Canada: Linde Company, Division of Union Carbide Canada Limited, Toronto.

Linde UNION CARBIDE

The term "Linde" is a registered trade-mark of Union Carbide Corporation.

ings. Threaded nut inserts also may be pressed into sheets or parts. Heeled punches and dies are available for hogging out larger diameter holes and shapes than the maximum 2 in. diameter holes provided with standard hole punching units.

The all-welded punch operates at 10 tons capacity from 65 to 75 psi air line pressure.

Built-in scales insure accurate locations of holes and notches in the work.

For more information, *write* Punch Products Corp., 3800 Highland Ave., Niagara Falls, N. Y.

Glass Reflects Heat

PERSONNEL working in areas of intense heat can be protected by a plate glass heat shield which reflects 65 per cent of long wave infrared rays.

The window of the tempered Pyrex glass is covered with a thin, transparent metallic film. The heat bounces off the coating which is permanently bonded to the glass. The glass itself does not become hot.

The low expansion glass has excellent thermal shock resistance and high mechanical strength. The reflective film is nonclouding. Like the glass, the coating resists abrasion and chemical attack.

For more information, *write* Corning Glass Works, Corning, N. Y.

Hydraulic Cutter Speeds Cutting of Rods and Bars

QUICK, safe, and efficient cutting of ferrous and nonferrous rods or bars up to $1\frac{3}{8}$ in. in diameter is possible with the Porter hydraulic cutter.

It consists of a cutter head and a portable, heavy duty power pump. The cutter head has a pistol grip

and can be operated with one hand. Power is applied through finger pressure on a control button.

For further ease in cutting, cutter heads may be suspended from a self-retracting spring balancer so that the tool virtually floats over a large work area, relieving the operator of strain and speeding cutting operations.

For more information, *write* H. K. Porter Inc., Somerville 43, Mass.

Flooring Resists Chemicals

SUPERIOR resistance to chemical attack and mechanical abuse are claimed for Emeri-Epox, a fast setting flooring material. It is recommended for topping or resurfacing concrete, wood, tile, stone, brick, and metal flooring.

The material combines a specially graded emery and an epoxy resin binder. It is supplied as a package containing two components, the dry mix of emery aggregate and epoxy resins, and a liquid catalyst.

Complete curing of the material results in 8 to 12 hours at room temperature.

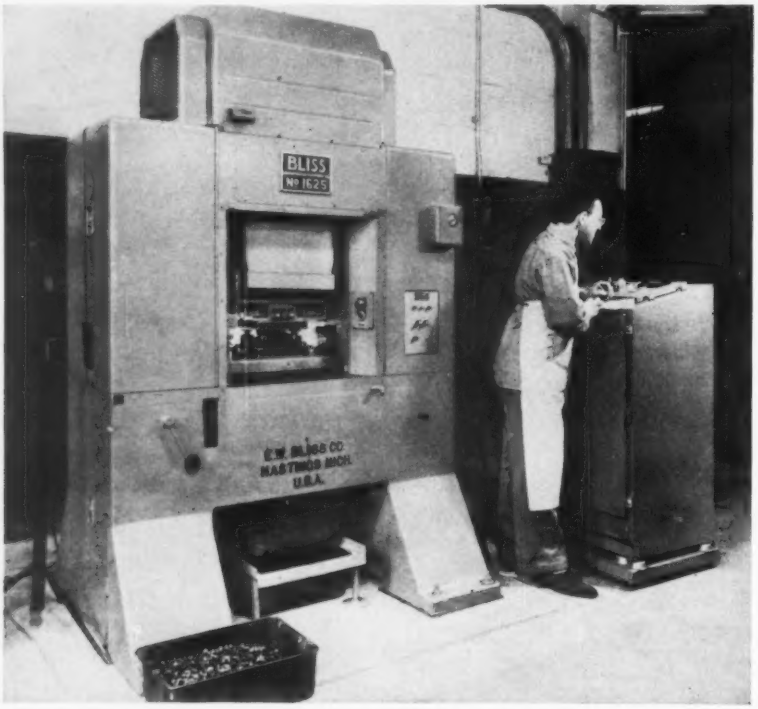
For more information, *write* Emeri-Epox, Walter Maguire Co. Inc., 60 E. 42nd St., New York 17, N. Y.

Air Cylinders Make Movement Automatic

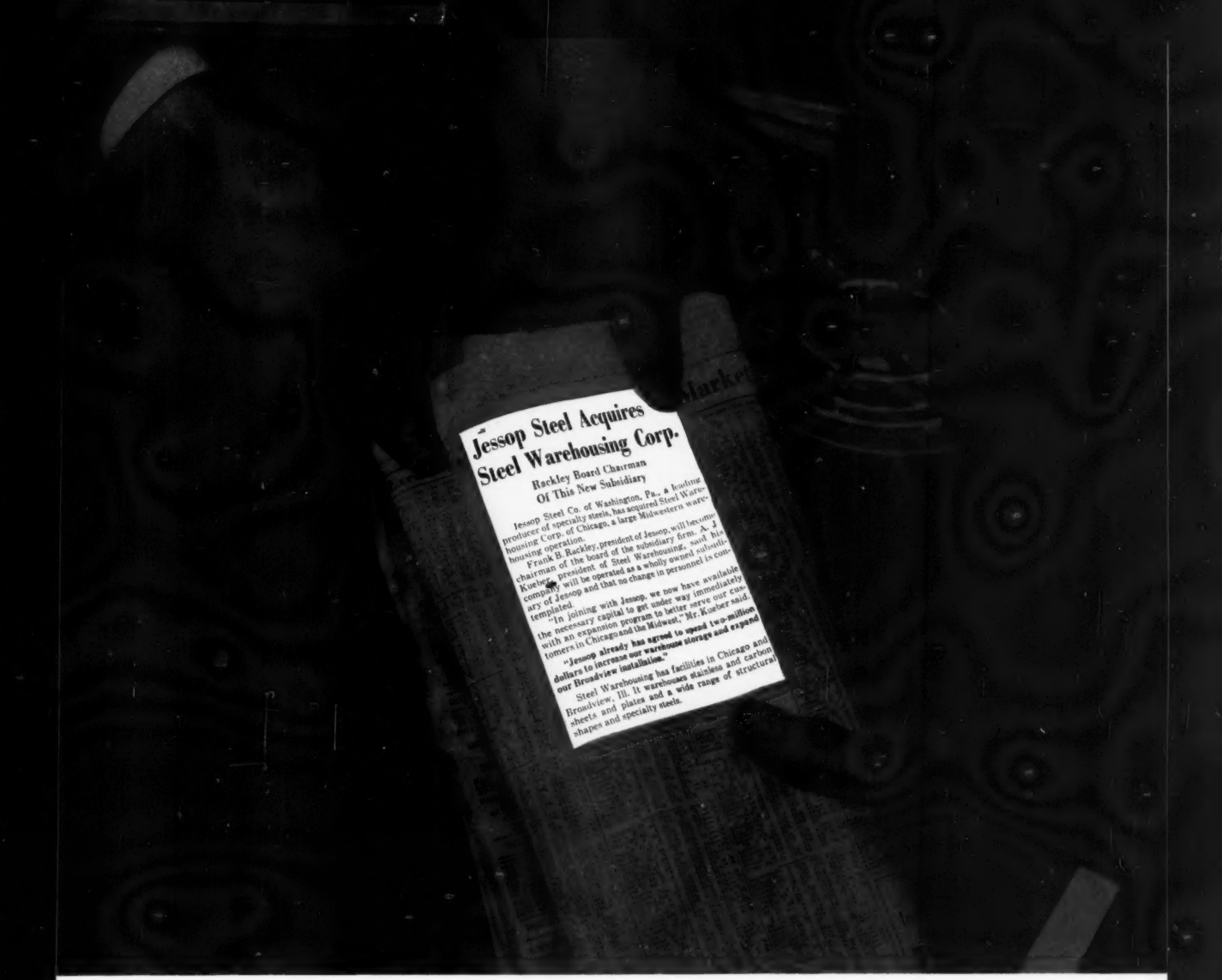
HOLDING, positioning, work moving, or fatiguing motions can be made automatic with a line of square-end, double acting air cylinders.

Conforming to JIC standards, the cylinders are designed for air pressures up to 250 psi or hydraulic pressures up to 750 psi.

Five mountings are available—



THIS 25-TON BLISS PRESS has a proven production line capacity of 1000 strokes a minute. For stamping retaining rings and other fastening devices, the machine has several special design features which permit the extremely high speed. One is a counterbalancing system which works in opposition to the force frequencies set up by the slide and, in effect, nullifies them, minimizing vibration. A light duty, single roll feeds coil strip through the press. For more information, **write** E. W. Bliss Co., 1375 Raff Rd. S.W., Canton 10, Ohio


Jessop Steel Acquires
Steel Warehousing Corp.
Rackley Board Chairman
Of This New Subsidiary
Jessop Steel Co. of Washington, Pa., a leading
producer of specialty steels, has acquired Steel Ware-
housing Corp. of Chicago, a large Midwestern ware-
housing operation.
Frank B. Rackley, president of Jessop, will become
chairman of the board of the subsidiary firm. A. J
Kueber, president of Steel Warehousing, said his
company will be operated as a wholly owned subsidi-
ary of Jessop and that no change in personnel is con-
templated.
"In joining with Jessop, we now have available
the necessary capital to get under way immediately
with an expansion program to better serve our cus-
tomers in Chicago and the Midwest," Mr. Kueber said.
"Jessop already has agreed to spend two-million
dollars to increase our warehouse storage and expand
our Broadview installation."
Steel Warehousing has facilities in Chicago and
Broadview, Ill. It warehouses stainless and carbon
sheets and plates and a wide range of structural
shapes and specialty steels.

Jessop buys Steel Warehousing Corporation . . . another reason for your confidence!

When you specify Jessop specialty steels, you've got good reasons for that decision. For example . . .

With Jessop, you're dealing with success. Although it's only two years since the acquisition of Green River Steel, Jessop now adds Steel Warehousing of Chicago. Already a two million dollar expansion of warehousing facilities is underway.

This fast growth didn't just happen. It results from the Jessop policy of producing the highest quality specialty steels *and keeping delivery promises!*

Yes, you have good reasons to be confident when you specify Jessop.

VMA 6721

JESSOP
STEEL COMPANY
Washington, Pennsylvania

Subsidiary Companies:

Green River Steel Corporation, Owensboro, Kentucky
Jessop Steel of Canada, Ltd., Wallaceburg, Ontario
Jessop Steel International Corporation, New York City
Steel Warehousing Corporation, Chicago and Broadview, Ill.

Stainless, alloy, tool, cast-to-shape, and forging steels, precision ground flat stock, and other specialty steels

bolt, flush, leg, base, or side flush. The square-end design and interchangeable mounting plates permit mounting the cylinders in either parallel or 90 degree position relative to ports.

Other features include cartridge-type bronze bearing with self-adjusting U-cup piston rod seal; ground, hard chrome plated piston rods with minimum yield strength of 125,000 psi; all-machined cylinder ends and mounting plates; and high tensile strength tierods with 87,000 to 107,000 psi yield.

For more information, *write* A. Schrader's Son Div., Scovill Mfg. Co., 470 Vanderbilt Ave., Brooklyn, N. Y.

Instrument Measures Thickness Ultrasonically

FIELD inspection of structures where corrosion is suspected can be made easily with the Audigage Model 6 ultrasonic thickness tester. The self-contained nondestructive tester will measure most metals, glass, ceramics, and plastics from one side.

The unit weighs less than 5 lb, including batteries, probe, harness, cable, and earphones.

The instrument is of the direct reading type. By setting a selector switch to one of three positions, the thickness of steel, aluminum, or copper is determined automatically, without conversion charts or separate calculations. A fourth position is provided to permit calibration for other materials.

For more information, *write* Branson Instruments Inc., 40 Brown House Rd., Stamford, Conn.

NEW literature

Write directly to the company for a copy

Punch and Die Catalog

A 50-page catalog and stock list (No. 60) shows a complete range of round, square, and oblong punches; dies and rivet sets. Geo. F. Marchant Co., 1420 S. Rockwell St., Chicago, Ill.

Polyester Resins Data

Three brochures on polyester resins reinforced with glass fiber describe several new fast curing resins for hand lay-up work and premix compounds, as well as a new chemical resistant resin. Finishes Div., Interchemical Corp., P. O. Box 659, Newark 1, N. J.

Abrasion Resistant Alloy

The four new hardness ranges and other properties of Jalloy, a heat-treated, abrasion-resistant alloy steel, are described in a pamphlet. Public Relations & Advertising Dept., Jones & Laughlin Steel Corp., 3 Gateway Center, Pittsburgh 30, Pa.

Martensitic Stainless Strip

A booklet explains why martensitic stainless steels have made inroads into many applications previously restricted to straight high carbon strip steels. Uddeholm Co. of America, 155 E. 44th St., New York 17, N. Y.

Inventory Aid

"Steel Inventory Check Sheet" helps steel users analyze their inventory practices. Hanover Div., Solar Steel Corp., 651 Lehigh Ave., Union, N. J.

Foil Gage Catalog

A 6-page bulletin, No. 4320, discusses etched foil gages and improved engineering features which have aided in the study of stress analysis problems. Electronics & Instrumentation Div., Baldwin-Lima-Hamilton Corp., 42 Fourth Ave., Waltham 54, Mass.

X and Gamma Rays

"Are You in This Profit Picture?" considers the advantages and disadvantages of inspection by x-radiation and gamma radiation and answers questions most frequently asked about each. Picker X-Ray Corp., 25 S. Broadway, White Plains, N. Y.

Aluminum Designation System

This bulletin explains the four-digit and temper designation system, both old and new, for aluminum alloys. Ziegler Steel Service Corp., 7022 Bandini Blvd., Los Angeles 22, Calif.

ABCs of Rust Prevention

A 20-page booklet presents basic information on rust, its causes, and application of preventives. Rust-Lick Inc., 755 Boylston St., Boston 16, Mass.

Grinding Gage Catalog

A 16-page catalog covers the complete line of Arnold continuous grinding gages. Federal Products Corp., 1144 Eddy St., Providence 1, R. I.

Carbon Steel Chart

A carbon steel specification chart (Sec. E, No. 1) shows the chemical analysis requirements for 60 most frequently used military and federal specifications. It also lists specified forms (sheets, bars, etc.) and nearest corresponding SAE, AISI, and AMS type numbers. Peter A. Frasse & Co. Inc., 17 Grand St., New York 13, N. Y.

Centralized Lubrication Data

"A Report to Management," a 16-page brochure, discusses application of modern centralized lubrication to reduce industrial operating costs and improve production. Industrial Div., Lincoln Engineering Co., 4010 Goodfellow Blvd., St. Louis 20, Mo.

Proper Grouting Practices

Bulletin E1d, 16 pages, describes Embeco nonshrink grout, and outlines methods of grouting different types of equipment, mixing and placing of grout in cold and hot weather. Master Builders Co., Cleveland 3, Ohio.

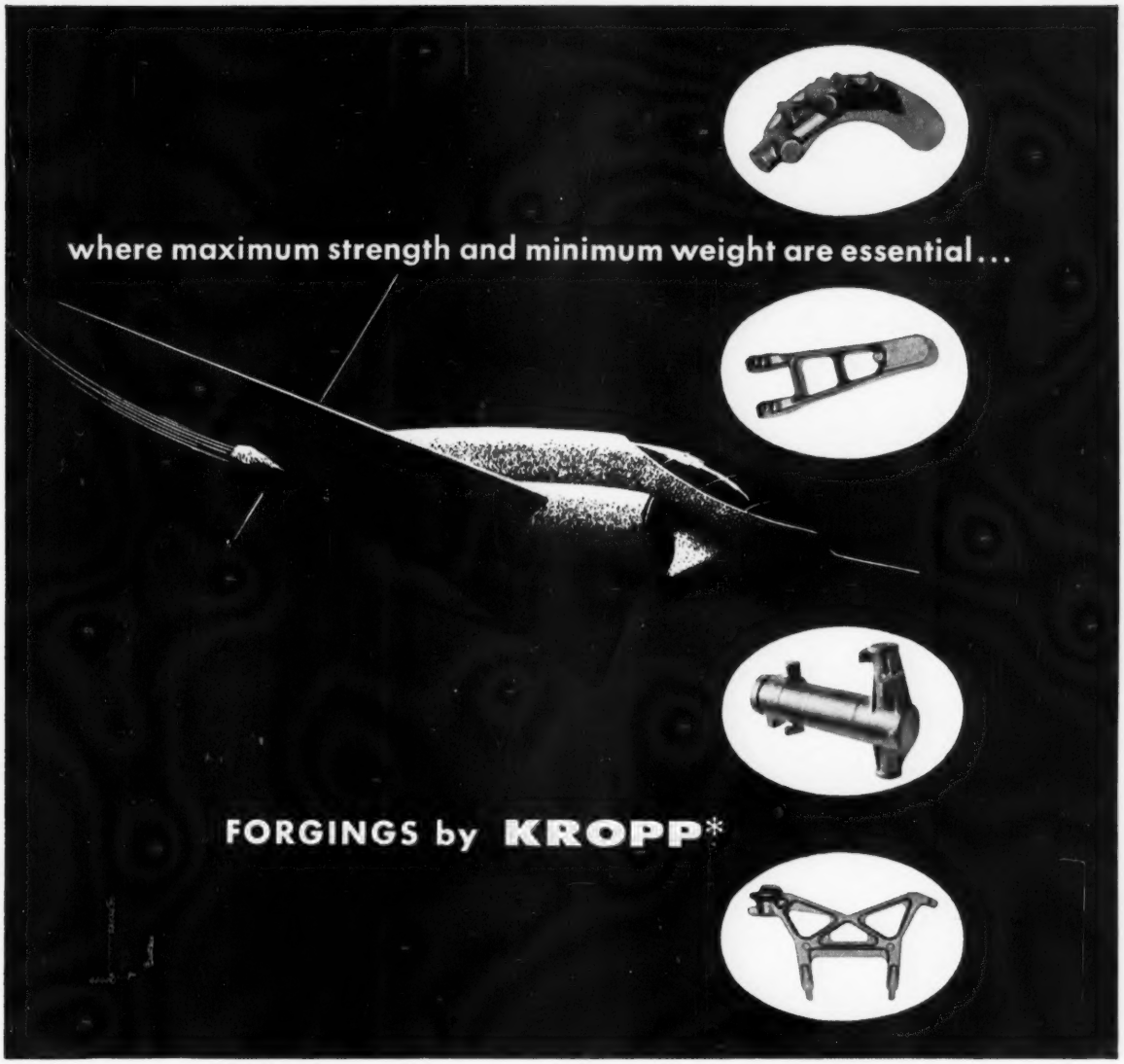
NEW BOOKS

Materials for Rockets and Missiles, Robert G. Frank and William F. Zimmerman, Macmillan Co., 60 Fifth Ave., New York 11, N. Y. 124 pages, $4.50

This volume brings together engineering data on the lightweight, high temperature materials which are available for rockets and missiles, and previews materials which are expected to become available during the next few years. Materials are compared according to their chemistries and selected physical properties. The recommended material for each application is cited. New fabrication processes, including high temperature brazing, chipless production, and unconventional machining techniques are also covered.

The Physical Chemistry of Steelmaking, John Wiley & Sons Inc., 440 Fourth Ave., New York 16, N. Y. 257 pages, $15

This volume contains 43 papers presented at the Conference on the Physical Chemistry of Iron and Steelmaking held at Massachusetts Institute of Technology. It is divided into sections covering: 1. Liquid metals and properties of solutes in liquid iron and steel. 2. Equilibria of reactions in liquid iron and steel. 3. The behavior of metal oxides and of components of iron and steelmaking slags. 4. Slag-metal equilibria in blast furnace and steelmaking furnace systems. 5. Kinetics and slag-metal reactions. 6. Reaction rates in iron and steelmaking processes. 7. Application of fundamental data to process development and metallurgical problems in the steel industry. 8. Solidification of castings and ingots. 9. Research planning.



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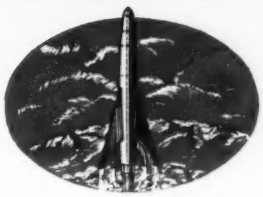

"for missiles, too!"

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MILWAUKEE COKE SOLVAY

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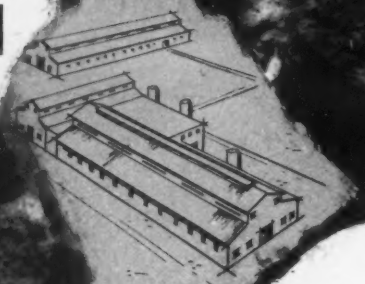

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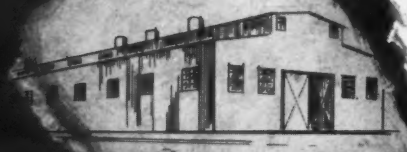

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May 18, 1959

Second Quarter Will Be Biggest in History

RECORD BREAKING steel shipments in May will carry the industry to the biggest quarter in its history.

Steelmakers gained the first leg on their shipping trophy last month when they put out more than 8.3 million net tons of finished metal. (The best they'd done in any previous month was 8.25 million in March, 1956.) May shipments will set a record: 8.5 million to 8.75 million tons. June shipments will dip to 8.3 million, even though pressure from customers will be greater than ever because of the strike threat and because metalworkers are using the metal at high rates. Yet next month's shipments will decline for these reasons: 1. Steelmakers will have to start banking their furnaces toward the end of the month if a walkout seems inevitable. 2. Wildcat strikes may hamstring production. 3. The month has fewer shipping days than May. 4. Transportation problems will delay shipments.

In spite of the June letup, second quarter shipments will be more than 25 million net tons. The best previous quarter was the second in 1956, when 23.6 million were shipped. Because of this year's slow start (20.8 million tons shipped in the first three months), first half outturn probably won't match that of 1956 (46.9 million tons).

AUTOMAKERS BUY HEAVILY— Direct mill shipments to the automotive industry in March were the highest in history (1.76 million net tons vs. 1.68 million in March, 1955). Even so, the car manufacturers are behind schedule in their inventory buildups. Case in point: Ford Motor Co. has been asking steelmakers whether they can ship an extra 10,000 tons of sheets in June. Manufacturers of electrical machinery and equipment also received record shipments in March (250,394 net tons vs. 247,600 in June, 1956).

SLOW DELIVERIES FEARED— There has been no letup in pressure for the shipment of sheets prior to June 30. Although mills have no extra tonnage available for first half delivery, customers are still trying to supplement orders they placed months ago. Eastern steelmakers report surprisingly good third quarter entries for sheets. Elsewhere, bookings for July and August are concentrated mainly in galvanized products and sheared plates.

STRUCTURALS GAIN— Structural shapes are coming into their own with the return of good construction weather. Wide flange beams are nearly sold out for the first half. Because of the strike threat, fabricators have taken in a lot of steel that won't be needed until the third quarter. If they had more definite ideas about their requirements, they'd continue buying.

SEAWAY TO BENEFIT TEXANS?— Many American steel producers are wringing their hands because the St. Lawrence Seaway may bring big tonnages of cheap European metal to their doorsteps, but mills in the Southwest aren't alarmed. They think the inland water route will take some of the pressure off Texas as a major dumping ground. The first two vessels carrying steel into Buffalo brought 8000 tons of scrapped rails, only 700 tons of finished steel. Estimates of imports in the next month or so range to 25,000 tons or more.

PRODUCTION AT PEAK— Last week, steelmakers operated their furnaces at 95 per cent of capacity and turned out 2,690,000 ingot tons—the largest production ever recorded.

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*Current prices were published in the May 11 issue and will appear in subsequent issues.

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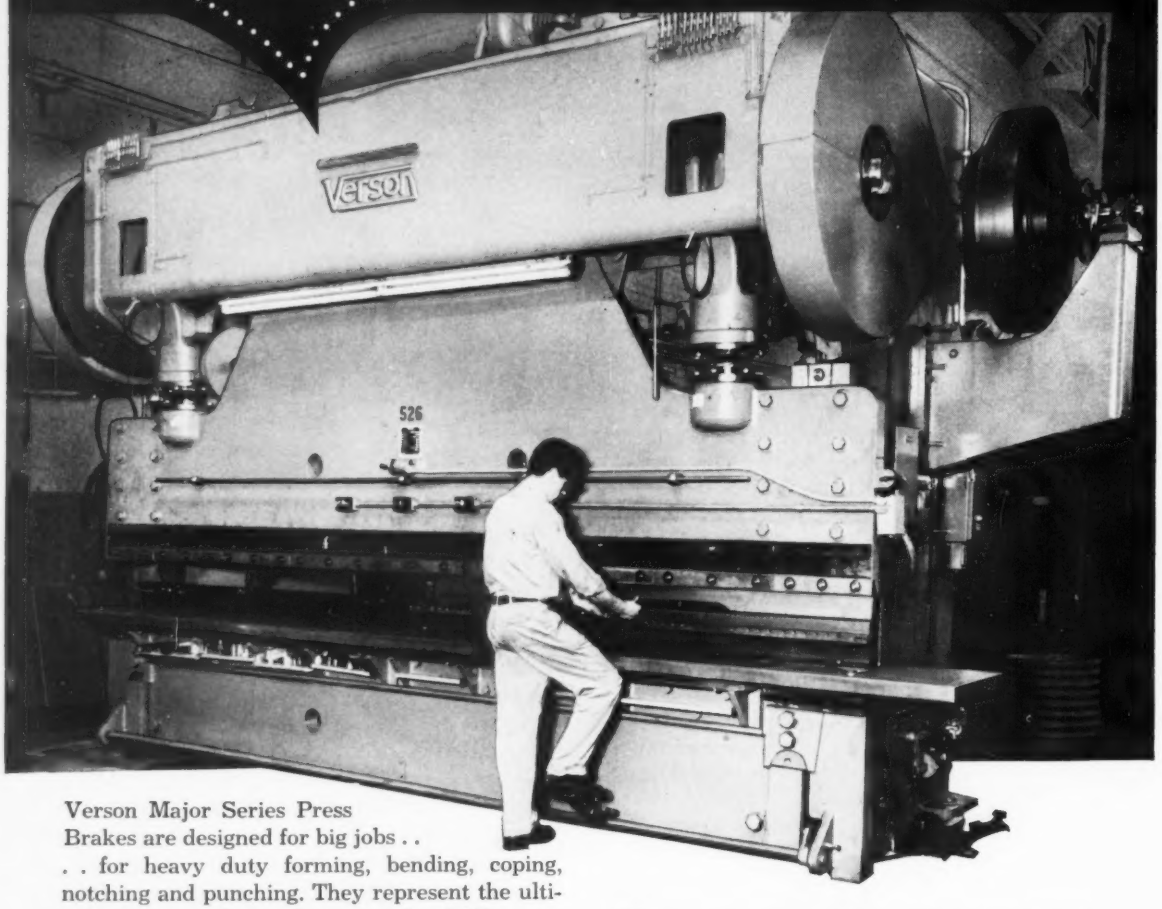
for BIG JOBS...for Precision Performance...

Choose Verson Major Series Press Brakes



Verson Major Series Press Brakes are designed for big jobs . . . . for heavy duty forming, bending, coping, notching and punching. They represent the ultimate in press design for strength, rigidity, endurance, accuracy and power.

Compare the design features of Verson Major Series Press Brakes against any other make . . . you'll see why these machines have earned such wide acceptance among manufacturers who demand the utmost in performance, precision and production.

Verson also offers four other basic lines of mechanical press brakes . . . smaller in size. A complete line of hydraulically operated press brakes is also available.

Whatever your requirements, there is a Verson Brake to fit your particular job. Let Verson application engineers help you in making your selection. Call or write, today.

Send for CATALOG B-55

From 15 tons up, there is a Verson Power Press Brake to meet every requirement for forming, bending, coping, notching or punching. Send for your copy of this 28-page informative catalog. There is no obligation, of course.

A Verson Press for every job from 60 tons up.

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How Ryerson's New Steel Warehouse Pricing Structure Works in Pittsburgh

EXAMPLE A

SINGLE ITEMS . . . each item bought by a different customer — or — each item bought separately by the same customer on different days.

	Price Per 100 Pounds New Method	Old Method
2000 lb standard beams 3 x 5.7	$9.79	$10.55
1000 lb angles 2 x 2 x ¼	9.61	11.29
500 lb bars 1 in. rd. HR M-1020	10.47	13.74
5000 lb plates ¼ x 60 in. HR sheared	8.50	9.69
100 lb angles ½ x ½ x ⅛	18.02	19.24
12,000 lb sheets 12 x 42 x 120 HR	7.77	8.70

In all these cases the single item price is lower and the total invoice savings will vary from about $1 net on the 100 lb item to about $110 net on the 12,000 lb item.

EXAMPLE B

TOTAL ORDER OF 20,600 lb (all items bought at one time by one customer).

	Price Per 100 Pounds New Method	Old Method
2000 lb standard beams 3 x 5.7	$9.49	$9.55
1000 lb channels ¾ x ⅜ x ⅛	12.47	11.04
480 lb bars 3 in. rd. HR C-1018	11.38	9.44
5000 lb plates ¼ x 60 in. 40/50 carbon	10.67	10.99
120 lb bars ⅜ x 2 flat HR 40/50 carbon	15.30	9.84
12,000 lb sheets 12 x 42 x 120 HR	7.67	8.45
Total Order—20,600 lb.		

On some items the price per 100 pounds goes up and on some the price goes down, but the total invoice cost is about $80 less on the new price basis.

EXAMPLE C

TOTAL ORDER OF 1370 lb (consisting of seven relatively small items).

	Price Per 100 Pounds New Method	Old Method
70 lb bars ⅜ rd. HR M-1020	$18.55	$11.89
120 lb bars ⅝ rd. HR C-1045	16.06	12.09
500 lb angles 1 x 1 x 3/16	11.29	11.69
150 lb sheets 16 x 30 x 96 HR	14.53	11.05
30 lb plates ⅜ x 11 in. x 14½ in. HR	18.11	12.19
300 lb channels 1 x ⅜ x ⅛	17.37	12.84
200 lb bars ½ x 2 flat HR	14.70	11.24
Total Order—1370 lb.		

This type of order is the most expensive to handle. Even with the savings on the 500 lb item 1 x 1 x 3/16 angle, shown in the example, the total invoice cost on the new price basis will be about $33 more than on the old.

HERE'S the new warehouse price structure on hot-rolled carbon steels, cold-rolled and galvanized sheets put into effect in the Pittsburgh area May 1 by Joseph T. Ryerson & Son Inc., Chicago.

It's based on combined application of item extras and order quantity discounts. "Net prices per size, based on turnover rates of the various product groups," replaces the familiar "base price plus extras" method long in vogue in the steel distributing industry.

• **Cost Study Findings**—Says Ryerson: "While we have always known that our order handling costs are lower on large orders than on small, we had thought of the total weight of all items combined as being the cost determining factor. But our cost studies have emphasized that handling costs vary according to the quantity per individual item. Those cost differences hold true regardless of the number of separate items on a single order, or of their combined total weight. In addition, faster turnover of the fast moving product groups enables us to offer them at lower prices."

• **How to Save**—Although there's still a price advantage to the steel buyer who groups several items into a single purchase to increase total order weight, the greater advantage will come through ordering larger quantities of individual items. Significant also is the fact that buyers of single items in the popular categories will now be charged less than before.

Item extras per 100 lb are:

10,000 lb and over	Base	
5,000 to 9,999 lb	plus	$ .10
2,000 to 4,999 lb	plus	.35
1,000 to 1,999 lb	plus	.85
400 to 999 lb	plus	2.00
100 to 399 lb	plus	6.00
Under 100 lb	plus	9.00

Order discounts per 100 lb are:

20,000 lb and over	less	$ .75
10,000 lb to 19,999 lb	less	.65
5,000 lb to 9,999 lb	less	.55
2,000 lb to 4,999 lb	less	.45
1,000 lb to 1,999 lb	less	.35
400 lb to 999 lb	less	.25
Under 400 lb	Base	

Steel Shipments in March Were Close to the Record

Shipments of finished steel products during March totaled 8,117,688 net tons, reports the American Iron & Steel Institute. The tonnage is second only to the monthly record of more than 8.3 million set in March, 1956.

Direct mill shipments to the automotive industry set a record of 1,761,521 net tons in the month. The total was 267,000 above the February tonnage and compares with the old record of 1,679,200 tons set in March, 1955.

Makers of electrical machinery and equipment also received record shipments during March, the total of 250,394 tons being up 28 per cent from the February figure. The former monthly record of 247,600 tons was set in June, 1956.

Records were set in shipments of three major categories of sheet steel: Hot-rolled sheets, 927,506 net tons; cold-rolled sheets, 1,557,042 tons; galvanized sheets, 311,961 tons.

WEBB PLATE FABRICATING MACHINERY

Steelworkers ALL STEEL CONSTRUCTION

DELIVERY 10 DAYS

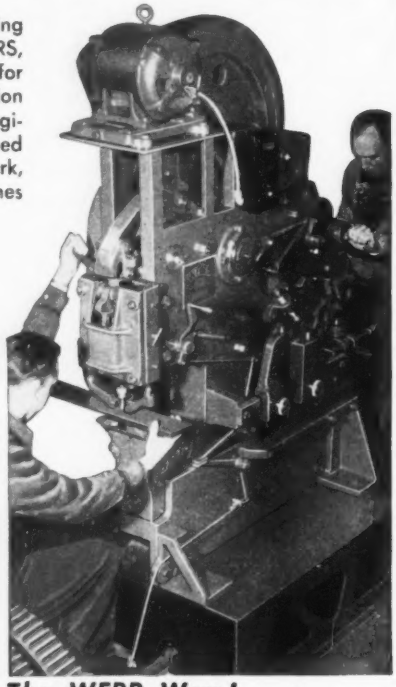
The Webb Corporation, in presenting the line of new WEBB STEELWORKERS, has designed versatile machines for either job-work or high production work. These units have been engineered to meet the particular need of shops having a variety of work, with a result that all-purpose machines are now available.

Five Complete Tools are Incorporated in a Single Unit.

1. Punch for plate, bars or structurals.
2. Cuts angles and tees with straight or miter cut.
3. Cuts off round and square bars.
4. Shears plates and bars.
5. Coping or notching attachment.

One of the main features of these machines is that they are at all times in complete readiness to do any of the above operations and to do the work well.

The punch may be operated at the same time as either the section cutter, bar cutter, shear or the coping and notching attachment . . . therefore, two operators can work at this machine simultaneously without interference. For illustrated literature and prices, write Dept. D.



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Sheets, Strip . . .

Sheet & Strip Prices, Pages 152 & 153

BUYING PRESSURE for sheets is not so much to get new tonnage on mill books as it is to get shipments by the end of June on orders placed some time ago.

Indications are some makers' carryover into the third quarter will be as much as a month's production of the major grades. This adds to the pressure from consumers.

There is only moderate buying for the third quarter, but it's better than had been expected. Some of the larger consumers are not only placing orders for July delivery, but they are seeking tonnage for shipment over the entire quarter. This does not mean they are placing all of their requirements for the period, but it does reflect their confidence in continued expansion of consumer goods markets over the summer. Forward buying is more noticeable in galvanized sheets than in other grades of flat rolled.

• **Running Behind** — Although they're running seven to ten days behind schedule on shipments, Pittsburgh sheetmakers have done a good job of processing orders. In the face of unprecedented demand, they've kept almost all their commitments. Truck shortages have caused some delays. Shippers can't get equipment as fast as they want it, and it's feared conditions will worsen next month.

Ford Motor Co. is reported asking for an extra 10,000 tons of sheets for June delivery. Other consumers are also seeking additional tonnage. However, since there have been few cancellations, it looks like they'll have little chance of adding to their tonnage on mill books.

Longest carryover into third quarter will be hot and cold rolled sheets, galvanized sheets, and plates. Galvanized sheets are in tightest supply of the light flat-rolled items. Tonnage is still being allocated on the basis of historical buying patterns.

• **Inventories Fall Short**—In general, consumers are resigned to the fact their stocks won't come up to expectations. They have been chewing up steel faster than they had anticipated, and mill shipments are being delayed in some instances. But manufacturers of some consum-

er goods, notably electrical appliances, are reported to have rather large inventories of finished steel goods. It isn't likely they'll get caught short if there's a brief steel strike. When the pickup in appliances came this year, the industry considered its stocks too light and began bolstering them. It ordered steel generously but used up much of its intake as quickly as possible by turning out finished goods for inventory—easing the problem of finding storage space for steel.

Narrow cold-strip mills are late on delivery promises in some instances, but they are holding closer to shipment schedules than the sheet sellers. Most second quarter narrow strip tonnage will be shipped by June 30.

• **Contracts Placed**—Strapping steel contracts awarded by the General Stores Supply Office, Navy, Philadelphia, include: 170 tons, Brainard Steel Div., Sharon Steel Corp., Warren, Ohio; 125 tons, Independent Metal Strap Co., Brooklyn, N. Y.; 110 tons, Steel & Wire Products Co., Baltimore. The Quartermaster Corps, Army, Columbus, Ohio, has placed 70,000 steel drums, 55 gallon, with the Southline Metal Products Co., Houston, on its bid of $523,600.

Use of galvanized steel sheets in automobile manufacturing has increased by more than 700 per cent since 1954, reports the Committee on Galvanized Steel Sheet Research. Sixty-three lb were consumed in the average auto in 1958, vs. 8.9 lb in 1954. Total galvanized sheet tonnage shipped to the autobuilders rose from 24,400 in 1954 to 133,215 tons in 1958. Another increase is predicted for this year.

Wire . . .

Wire Prices, Pages 153 & 154

Wire consumers are placing more third quarter orders in New England, but in cases where supply will not be halted, shipment prior to September is not urgent. Exceptions are suppliers to the automotive industry, particularly of high carbon wire, and to some extent, to the fastener makers who want cold heading grades. In most cases, consumers in these groups will fall short of their estimated inventory buildup; they are placing third quarter orders with a view to establishing favorable positions in mill schedules after the strike, if there is one.

Manufacturers' grades are in top demand, with all signs pointing to a heavy flow of orders for the next 60 days. Usually, a wire production slump is experienced during the summer, largely because automotive needs taper off then. Likewise, the furniture trade is less active, and requirements for cooling and ventilating equipment decline.

Foreign competition continues to be a severe headache for domestic wiremakers, especially in the merchant products. It's estimated that 51 per cent of the nails purchased in the Pacific Coast area in the three months ended Mar. 31 were imported. Barbed wire imports accounted for 57 per cent of the coast market for that product.

For Naval shipyard, Portsmouth, N. H., a $132,750 contract has been placed for 75 tons of bar welding wire with Air Reduction Sales Co.

STAINLESS COSTS LESS THAN ALUMINUM—

Do you know that the square-foot cost of stainless steel sheet for curtain wall panels is usually equal to or lower than aluminum when compared in thicknesses of equal indentation resistance? For example, Type 302 stainless steel, .022″ thick is equal to .051″ aluminum and costs only 62¢ per sq. ft., as compared to 67¢ per sq. ft. for 3003-H14 anodized aluminum.

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Steel Bars . . .

Bar Prices, Page 151

Except for some stock sizes in cold drawn, bar sellers have virtually nothing to offer for delivery over the remainder of this quarter. Some say they will wind up with a carryover because they are already running a little behind on commitments. But they don't expect to be behind more than two weeks by the end of June. Others think they won't be behind even that much.

Demand is fairly diversified. Third quarter ordering is showing some improvement, with interest partly due to the desire of buyers to obtain a good position in mill schedules once the steel strike (if there is one) is over.

An additional contract for the Army's new M-14 rifle has increased demand for gun barrel stock in New England. Three firms have contracts totaling $13 million, including Harrington & Richardson Inc., Worcester, Mass., 35,000 units, $4,116,250. Others are: Winchester, New Haven, Conn., and Saco Lowell Shops Inc., Biddeford, Maine (machine guns). The contracts increase bar requirements for small arms to a postwar high. Machine tools and new tooling will cost several millions.

Frankford Arsenal, Philadelphia, closes May 12 on 185 tons, steel forgings (35,325); about one-half set aside for labor surplus area shops.

cut disposal costs by two-thirds . . .

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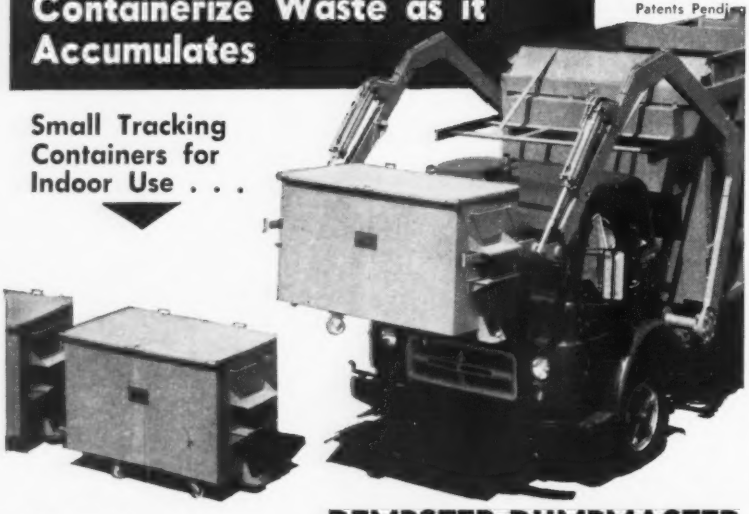
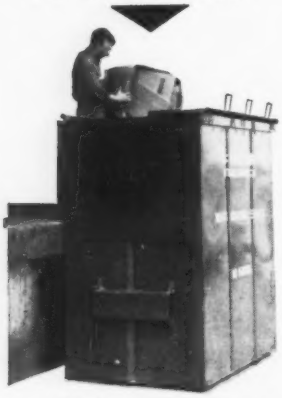


Large Containers for Outside Use



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Plates . . .

Plate Prices, Page 151

Demand for plates would be brisk even if customers weren't hedging against a possible strike this summer.

At Pittsburgh, a leading producer of sheared plates is a month behind on shipments from its 96 in. mill, but this hasn't triggered any cancellations. Users want everything they've ordered even if they have to wait until after a strike to get it.

Carryovers on other sheared plate mills are expected to be no larger than normal. If a strike's averted, near capacity operations are assured through July.

While some universal plates can still be worked into second quarter schedules, the mills are generally sold out for the period. Sheared plates and strip have been out of the question for second quarter for some time. Actually, the situation in universal plates is about as tight, except for a few "holes" which will be filled without too much trouble.

Third quarter demand is increasing, but in terms of orders on books is nowhere near current levels. Producers are confident they'll book enough tonnage to keep their mills fully occupied. July and part of August capacity in sheared and strip-plate is spoken for in the case of most mills, taking particularly into account a likely carryover of at least two weeks from the second quarter.

One mill whose labor contract doesn't expire for a month after the July 1 deadline for most producers has been faced with especially heavy plate inquiry.

Except for grade Hy-80, high tensile naval shipyard specification, shipbuilding demand has declined. Lukens Steel Co., Coatesville, Pa.,

booked one contract for Hy-80 grade, 6230 tons, at $3,910,121, and fabricated head and flange work, same grade, at $429,807.

Tubular Goods . . .

Tubular Goods Prices, Page 155

All tubular products except standard seamless and drill pipe are sold out for the first half. Since oil producers can't get any more tubing from the mills before July, they're cleaning out the downriver stocks.

Fastest moving items are 2⅜ in. and 2⅞ in. OD tubes; J-55 tubes are in tightest supply.

Demand for drill pipe remains sluggish because consumers have big inventories. The mills are keeping deliveries on schedule, and so far they've had no trouble getting barges. Trafficmen think it'll be next month before difficulties are encountered in shipping.

Fully committed for the first half on trunk line pipe, producers have substantial bookings for the third and fourth quarters.

Demand for standard pipe has picked up with the return of good construction weather. One producer booked 87 per cent of its buttweld capacity in April and expects to run nearly full this month.

The tubemakers are booking sizable tonnages of standard pipe for July and August delivery, apparently because consumers fear a strike and want to be first in line when production is resumed.

Oilfield casing and tubing suppliers have favorable news from the oil industry as Hughes Tool Co.'s survey shows that for the fifth straight week U. S. drilling operations set a new 1959 high. For the week ended May 4, Hughes counted 2134 rotary rigs in operation, a gain of 26 over the previous week, and up 321 from a year ago.

Alaska Public Works has awarded a $480,657 contract for water system improvements at Fairbanks, Alaska, to the Morrison-Knudsen Co.

Phoenix Steel Tube Div., Phoenix Steel Corp., Phoenixville, Pa., is now manufacturing seamless low-chrome analyses pipe and tubing in diameters from 8.625 in. to 16 in., and wall thicknesses from ⅜ in. to 3 in.

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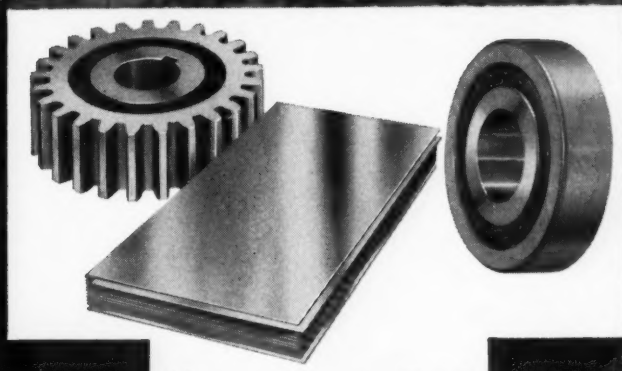

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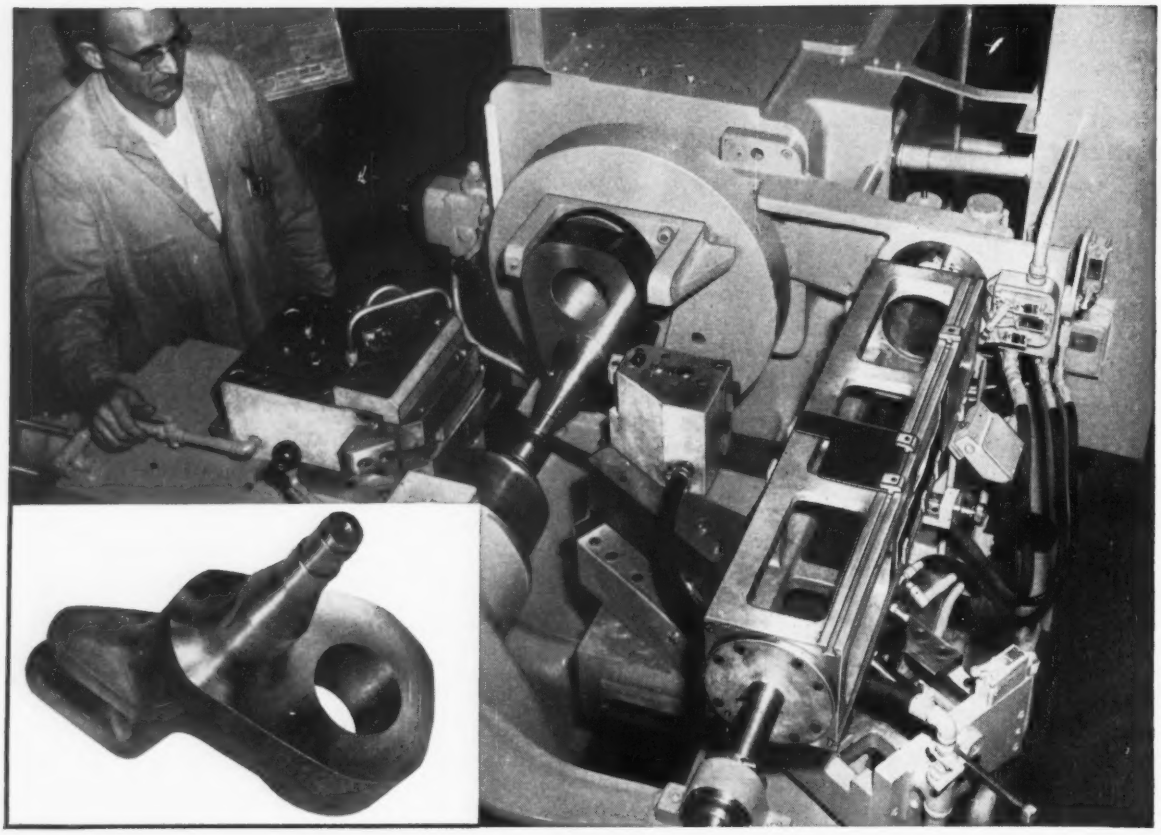

Whips problem part with right equipment

Handles tough, interrupted cut and contour machining easily with Gisholt No. 24 Automatic with JETracer

Here's how this producer is holding floor-to-floor time on military tank idler arm forgings—18″ long with 5½″ major radius—to just 21.1 minutes.

The job is done with the powerful Gisholt No. 24 Automatic Production Lathe, using a JETracer on the rear independent slide, plus a 2-speed motor for correct machining speeds when facing and turning.

With the part held between centers, a special face plate fixture locates the work and drives against the large O.D. radius. All cuts are made separately; each slide performs a rough and finish pass. The front tool slide faces at 60 r.p.m. and .015″ feed (306 f.p.m.) and has automatic tool relief. Two tools divide the length of cut to shorten machining time. A special step-over cam arrangement repositions the front carriage and its tools for the finish pass.

The JETracer uses a 4-position indexing cam roll (permitting up to 4 automatic passes if needed), and controls the rear slide which turns all diameters on the idler arm at 180 r.p.m. and .015″ feed (259 f.p.m.).

Whatever your production picture on large parts—long steady runs or small repeat lots—you'll find proven ways to cut costs with the Gisholt MASTERLINE No. 24 Automatic Production Lathe. One operator handles 2 or more of these powerful machines, or does other jobs during machining time, because all machine functions are automatically controlled. Setups and change-overs are fast and simple.

For complete details on the No. 24 and other Gisholt machines, call your Gisholt Representative today. He has the facts, and his wide experience may point the way to more profitable production in your plant.

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Steel Production Is Best Ever Reported for April

Steel production last month was record breaking for April, totaling 11,272,000 net tons, reports the American Iron & Steel Institute. Production exceeded 11 million tons for the second month in a row. In March the furnaces poured 11,567,745 tons, a record for any month. Prior to March, the only 11-million-ton months were October, 1956, and January, 1957.

In April last year, output amounted to only 5,532,991 tons.

Production in the first four months this year was 41,760,068 tons, an increase of 71.7 per cent over the 24.3 million produced in the first four months a year ago. The record output for the first four months of any year was 42.4 million tons in 1956.

According to the institute's index of steelmaking, the April production was 163.7 in terms of the basic index of average output during 1947-49. This compared with 162.6 during March, and 80.4 in April, 1958.

The index figure for the first four months was 151.6 vs. 88.3 during the same period of last year.

Based on the Jan. 1, 1959 capacity of 147,633,670 net tons annually, the steelmaking facilities were utilized at an average of 92.2 per cent of capacity during April vs. 92.3 per cent in March. The figure for the first four months was 86.

Pig Iron . . .

Pig Iron Prices, Page 156

Merchant pig iron sellers say May will be their best month so far this year. Buying is leveling off at some points, but many consumers are still covering their requirements, though forward buying, despite the threat of a steel strike at the end of June, is not imposing.

Shipments are holding close to the April level which represented the peak for the first four months. Some slackening had been expected, and further easing in June is anticipated, though some foundries may begin to show more interest in strike hedge tonnage.

The call for foundry iron continues steady with foundries generally on a five-day week.

Steel Ingot Production—April, 1959

Period	OPEN HEARTH (Net tons)	BESSEMER (Net tons)	OXYGEN PROCESS (Net tons)	ELECTRIC (Net tons)	TOTAL (Net tons)	Per cent of capacity
1959						
January ...	8,280,985	120,005	186,820	729,575	9,317,385	74.3
February ..	8,541,031	128,515	176,970	756,422	9,602,938	74.3
*March ...	10,206,474	184,892	236,595	929,784	11,567,745	84.8
*1st Qtr. ..	27,038,490	433,412	600,385	2,415,781	30,488,068	83.8
†April	9,881,000	196,000	237,000	958,000	11,272,000	92.9

Period	—OPEN HEARTH— Net tons	Per cent of capacity	——BESSEMER—— Net tons	Per cent of capacity	——ELECTRIC—— Net tons	Per cent of capacity	——TOTAL—— Net tons	Per cent of capacity
1958								
January ..	6,085,124	58.6	121,338	35.5	547,440	44.8	6,753,912	56.5
February .	5,252,112	56.0	81,597	26.4	448,614	40.6	5,782,323	53.6
March	5,598,944	53.9	122,317	35.8	533,361	43.6	6,254,622	52.3
1st Qtr. ..	16,936,180	56.2	325,252	32.8	1,529,425	43.1	18,790,857	54.1
April	4,875,619	48.5	109,433	33.1	547,939	46.3	5,532,991	47.8
May	5,602,123	53.9	110,366	32.3	588,670	48.2	6,301,159	52.7
June	6,378,942	63.4	88,125	26.6	660,413	55.8	7,127,480	61.6
2nd Qtr. ..	16,856,684	55.3	307,924	30.7	1,797,022	50.1	18,961,630	54.0
1st 6 Mo..	33,792,864	55.7	633,176	31.7	3,326,447	46.6	37,752,487	54.1
July	5,712,587	55.0	114,218	33.4	615,600	50.4	6,442,405	53.9
August ...	6,481,185	62.4	134,435	39.3	692,383	56.6	7,308,003	61.1
September..	6,769,660	67.3	103,194	31.2	759,518	64.2	7,632,372	66.0
3rd Qtr. ..	18,963,432	61.5	351,847	34.7	2,067,501	57.0	21,382,780	60.3
9 Mo.	52,756,296	57.7	985,023	32.7	5,393,948	50.1	59,135,267	56.2
October ...	7,795,541	75.0	148,458	43.4	895,779	73.3	8,839,778	74.0
November..	7,572,555	75.3	145,867	44.1	850,896	71.9	8,569,318	74.1
December .	7,755,002	74.6	116,637	34.1	838,883	68.6	8,710,522	72.9
4th Qtr. ..	23,123,098	75.0	410,962	40.5	2,585,558	71.3	26,119,618	73.6
2nd 6 Mo..	42,086,530	68.3	762,809	37.6	4,653,059	64.1	47,502,398	67.0
Total	75,879,394	62.0	1,395,985	34.7	7,979,506	55.4	85,254,885	60.6

Note—The percentages are based on annual capacities as of Jan. 1, 1959: Open hearth, 126,528,380 net tons; bessemer, 3,577,000 net tons; basic oxygen process, 4,083,160 net tons; electric and crucible, 13,495,130 net tons. Total: 147,633,670 net tons. In 1958, the capacity tonnages were: Open hearth, 122,321,830 net tons; bessemer, 4,027,000 net tons; oxygen process, electric and crucible, 14,393,740 net tons. Total: 140,742,570 net tons.
*Revised. †Preliminary.

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Pittsburgh Steel Co. Is Dropping Merchant Wire Products Trade

PITTSBURGH STEEL CO. is quitting its oldest product line—merchant wire products. Consumers were informed (May 11) that no new orders for fence, chain link fabric, barbed wire, nails, and gates will be accepted. When orders on books are shipped, production of those products will cease—probably sometime in the third quarter.

Fence and wire were among the first products made by the company when it opened its Monessen, Pa., plant in 1902.

Merchant products have always required a high number of manhours per ton of product produced. One type fence requires 36 to 38 manhours. The average for merchant products is about 30 manhours per ton. With the company's employment costs climbing steadily, its profit margins on this line have vanished.

Monthly sales volume has been averaging around 2000 tons; sales have been way off during offseason winter months.

Four reasons are given for the company's action: 1. Advancing costs. 2. Falling volume. 3. Dim prospect for improved productivity per manhour of work. 4. Serious inroads of foreign competition in the American market. Because wages are considerably lower in Europe and Japan, producers of imported merchant products can undersell American mills by a wide margin.

Aware of the impact the decision will have on its employees, the company is making every effort to offset the loss of work. Manhours required at the company's present level of operations equals the working time of 360 people. As late as 1955, 900 employees were required.

The company recently expanded facilities for making highway welded wire reinforcing material, and its product development unit is working on several programs to bring new products into the Monessen Works finishing department.

• **Capital Improvements** — Several programs are being studied for the Monessen Works. Among them is a project to revamp the rod mills to permit production for direct sale.

Boltmaker Is Quitting

Buffalo Bolt Co., a division of Buffalo Eclipse Corp., North Tonawanda, N. Y., will discontinue operations June 30, C. Neal Turner, president of the division, announced. More than 800 employees will be affected. Also, the division is discontinuing boltmaking operations at its plant in Princeton, Ill., where about 25 are employed.

Mr. Turner listed several reasons for closing: Diminishing market in the bolt industry; problems arising from intense competition, and the prohibitive cost of rehabilitating, maintaining, and converting the plant to permit continuance in the competitive market.

Steel Imports, Via Seaway Substantial at Buffalo

Substantial tonnages of European steel are coming into Great Lakes ports now that the St. Lawrence Seaway is opened to large, ocean-going vessels.

About 3700 tons, including 700 tons of finished products, have been laid down at Buffalo. The Swedish freighter, *Sunanbris*, second foreign vessel to arrive at Buffalo since the opening of the seaway, carried 3000 tons of used rails from Scotland. The material will be rerolled into fence posts, signposts, and reinforcing bars.

The finished steel came from Belgium and the Saar Valley. It was consigned to several Buffalo area plants and was imported through Associated Metals & Transport Co. of New York.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 152

Some strike hedge buying of reinforcing bars continues. However, the bulk of demand is for jobs in hand. Production of reinforcing bars and wire mesh is close to a peak, and expectations are demand will hold at a high level throughout the summer.

DISTRICT INGOT RATES
(Percentage of Capacity Engaged)

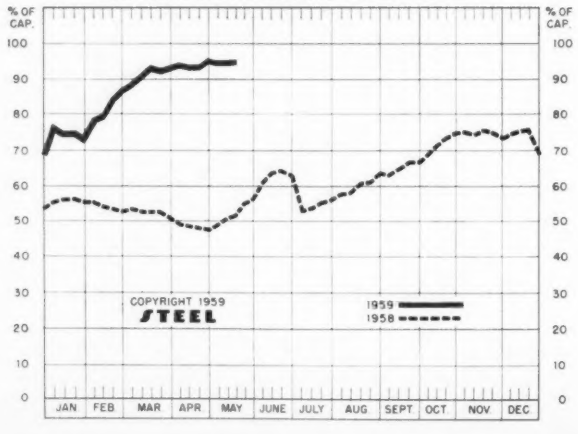
	Week Ended May 17	Change	Same Week 1958	Same Week 1957
Pittsburgh	96.5	+ 5*	53.5	90
Chicago	93	0*	55.5	85
Eastern	97	0	48.5	95
Youngstown	96	+ 2	45	81
Wheeling	93	+ 1	71	85.5
Cleveland	99.5	+ 4*	26	83
Buffalo	105	0	39	85.5
Birmingham	92	+ 1.5	66.5	93.5
Cincinnati	95	— 1.5*	52.5	71.5
St. Louis	101	— 4.5	77	85.5
Detroit	97	— 2*	37.5	82.5
Western	96.5	+ 2.0	67	99
National Rate	95	+ 0.5	51.5	86.5

INGOT PRODUCTION‡

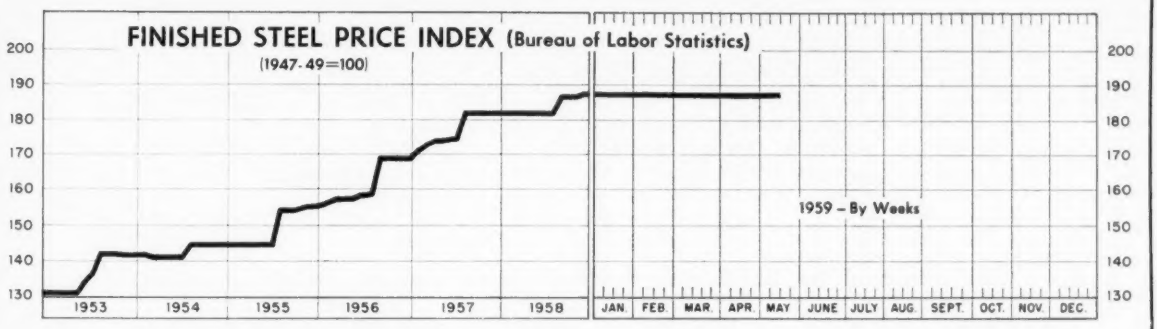
	Week Ended May 17	Week Ago	Month Ago	Year Ago
INDEX (1947-49=100)	165.9	162.1	165.4	87.9
NET TONS (In thousands)	2,665	2,604	2,657	1,412

*Change from preceding week's revised rate. †Est'mated. ‡American Iron & Steel Institute. Weekly capacity (net tons): 2,831,331 in 1959; 2,699,173 in 1958; 2,559,490 in 1957.

NATIONAL STEELWORKS OPERATIONS



Price Indexes and Composites



May 12, 1959	Week Ago	Month Ago	April Avg.	Year Ago
186.7	186.7	186.7	186.7	181.6

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended May 12

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them, write to STEEL.

Rails, Standard No. 1	$5.825
Rails, Light, 40 lb	7.292
Tie Plates	6.875
Axles, Railway	10.175
Wheels, Freight Car, 33 in. (per wheel)	62.000
Plates, Carbon	6.350
Structural Shapes	6.167
Bars, Tool Steel, Carbon (lb)	0.560
Bars, Tool Steel, Alloy, Oil Hardening Die (lb)	0.680
Bars, Tool Steel, H.R. Alloy, High Speed, W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.060 (lb)	1.400
Bars, Tool Steel, H.R. Alloy, High Speed, W18, Cr 4, V 1 (lb)	1.895
Bars, H.R., Alloy	10.775
Bars, H.R., Stainless, 303 (lb)	0.543
Bars, H.R., Carbon	6.675
Bars, Reinforcing	6.385
Bars, C.F., Carbon	10.710
Bars, C.F., Alloy	14.125
Bars, C.F., Stainless, 302 (lb)	0.570
Sheets, H.R., Carbon	6.350
Sheets, C.R., Carbon	7.300
Sheets, Galvanized	8.615
Sheets, C.R., Stainless, 302 (lb)	0.658
Sheets, Electrical	12.625
Strip, C.R., Carbon	9.489
Strip, C.R., Stainless, 430 (lb)	0.480
Strip, H.R., Carbon	6.250
Pipe, Black, Buttweld (100 ft)	19.905
Pipe, Galv., Buttweld (100 ft)	23.253
Pipe, Line (100 ft)	199.530
Casing, Oil Well, Carbon (100 ft)	201.080
Casing, Oil Well, Alloy (100 ft)	315.213
Tubes, Boiler (100 ft)	51.200
Tubing, Mechanical, Carbon (100 ft)	27.005
Tubing, Mechanical, Stainless, 304 (100 ft)	205.608
Tin Plate, Hot-dipped, 1.25 lb (95 lb base box)	10.100
Tin Plate, Electrolytic, 0.25 lb (95 lb base box)	8.800
Black Plate, Canmaking Quality (95 lb base box)	7.900
Wire, Drawn, Carbon	10.575
Wire, Drawn, Stainless, 430 (lb)	0.665
Bale Ties (bundles)	7.967
Nails, Wire, 8d Common	9.825
Wire, Barbed (80-rod spool)	8.722
Woven Wire Fence (20-rod roll)	21.737

STEEL's FINISHED STEEL PRICE INDEX*

	May 13 1959	Week Ago	Month Ago	Year Ago	5 Yr Ago
Index (1935-39 avg=100)	247.82	247.82	247.82	239.15	189.74
Index in cents per lb	6.713	6.713	6.713	6.479	5.140

STEEL's ARITHMETICAL COMPOSITES*

Finished Steel, NT	$149.96	$149.96	$149.96	$145.42	$113.70
No. 2 Fdry, Pig Iron, GT	66.49	66.49	66.49	66.49	56.54
Basic Pig Iron, GT	65.99	65.99	65.99	65.99	56.04
Malleable Pig Iron, GT	67.27	67.27	67.27	67.27	57.27
Steelmaking Scrap, GT	33.33	33.67	34.67	32.83	27.67

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	May 13 1959	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bars, H.R., Pittsburgh	5.675	5.675	5.675	5.425	4.15
Bars, H.R., Chicago	5.675	5.675	5.675	5.425	4.15
Bars, H.R., deld., Philadelphia	5.975	5.975	5.975	5.725	4.405
Bars, C.F., Pittsburgh	7.65*	7.65*	7.65*	7.30*	5.20
Shapes, Std., Pittsburgh	5.50	5.50	5.50	5.275	4.10
Shapes, Std., Chicago	5.50	5.50	5.50	5.275	4.10
Shapes, deld., Philadelphia	5.77	5.77	5.77	5.545	4.38
Plates, Pittsburgh	5.30	5.30	5.30	5.10	4.10
Plates, Chicago	5.30	5.30	5.30	5.10	4.10
Plates, Coatesville, Pa.	5.30	5.30	5.30	5.10	4.10
Plates, Sparrows Point, Md.	5.30	5.30	5.30	5.10	4.10
Plates, Claymont, Del.	5.30	5.30	5.30	5.10	4.10
Sheets, H.R., Pittsburgh	5.10	5.10	5.10	4.925	3.925
Sheets, H.R., Chicago	5.10	5.10	5.10	4.925	3.925
Sheets, C.R., Pittsburgh	6.275	6.275	6.275	6.05	4.775
Sheets, C.R., Chicago	6.275	6.275	6.275	6.05	4.775
Sheets, C.R., Detroit	6.275	6.275	6.275	6.05-6.15	4.975
Sheets, Galv., Pittsburgh	6.875	6.875	6.875	6.60	5.275
Strip, H.R., Pittsburgh	5.10	5.10	5.10	4.925	4.425
Strip, H.R., Chicago	5.10	5.10	5.10	4.925	3.925
Strip, C.R., Pittsburgh	7.425	7.425	7.425	7.15	5.45
Strip, C.R., Chicago	7.425	7.425	7.425	7.15	5.70
Strip, C.R., Detroit	7.425	7.425	7.425	7.25	5.65
Wire, Basic, Pittsburgh	8.00	8.00	8.00	7.65	5.525
Nails, Wire, Pittsburgh	8.95	8.95	8.95	8.95	6.55
Tin plate(1.50 lb)box, Pitts.	$10.65	$10.65	$10.65	$10.30	$8.95

*Including 0.35c for special quality.

SEMIFINISHED STEEL					
Billets, forging, Pitts. (NT)	$99.50	$99.50	$99.50	$96.00	$75.50
Wire rods 7/32-5/8" Pitts.	6.40	6.40	6.40	6.15	4.525

PIG IRON, Gross Ton	May 13 1959	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bessemer, Pitts	$67.00	$67.00	$67.00	$67.00	$57.00
Basic, Valley	66.00	66.00	66.00	66.00	56.00
Basic, deld., Phila.	70.41	70.41	70.41	70.41	59.66
No. 2 Fdry, NevilleIsland,Pa.	66.50	66.50	66.50	66.50	56.50
No. 2 Fdry, Chicago	66.50	66.50	66.50	66.50	56.50
No. 2 Fdry, deld., Phila.	70.91	70.91	70.91	70.91	60.16
No. 2 Fdry, Birm.	62.50	62.50	62.50	62.50	52.88
No. 2 Fdry(Birm.)deld., Cin.	70.20	70.20	70.20	70.20	60.43
Malleable, Valley	66.50	66.50	66.50	66.50	56.50
Malleable, Chicago	66.50	66.50	66.50	66.50	56.50
Ferromanganese, net ton†	245.00	245.00	245.00	245.00	200.00

†74-76% Mn, Duquesne, Pa.

SCRAP, Gross Ton (Including broker's commission)					
No. 1 Heavy Melt, Pittsburgh	$34.50	$34.50	$36.50	$31.50	$29.50
No. 1 Heavy Melt, E. Pa.	33.50	33.50	33.50	34.50	23.00
No. 1 Heavy Melt, Chicago	32.00	33.00	34.00	32.50	30.50
No. 1 Heavy Melt, Valley	35.50	35.50	39.50	33.50	29.50
No. 1 Heavy Melt, Cleve.	33.50	33.50	36.00	30.50	28.50
No. 1 Heavy Melt, Buffalo	31.50	32.50	34.50	26.50	25.50
Rails, Rerolling, Chicago	55.50	56.50	57.50	50.50	42.50
No. 1 Cast Chicago	46.50	45.50	46.50	38.50	38.50

COKE, Net Ton					
Beehive, Furn., Connlsvl.	$15.00	$15.00	$15.00	$15.25	$14.75
Beehive, Fdry., Connlsvl.	18.25	18.25	18.25	18.25	16.75
Oven, Fdry., Milwaukee	32.00	32.00	32.00	30.50	25.25

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. . . loads and weighs stock house raw material into the skip hoist . . . delivers predetermined ingredients to furnace at the correct time and in proper sequence . . . maintains permanent record of all furnace loadings and exact time accomplished . . . then indicates when a bin needs refilling or clearing. This is but one of the many ways Westinghouse PRODAC† is helping bring about the "mill of the future" today through completely automatic stocking control for blast furnace charging.

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Steel Prices

Mill prices as reported to STEEL, May 13, cents per pound except as otherwise noted. *Changes shown in italics.* Code number following mill point indicates producing company. Key to producers, page 152; footnotes, page 154.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)
Munhall,Pa. U5 ..... $76.00

INGOTS, Alloy (NT)
Detroit S41 ..... $82.00
Economy,Pa. B14 ..... 82.00
Farrell,Pa. S3 ..... 82.00
Lowellville,O. S3 ..... 82.00
Midland,Pa. C18 ..... 82.00
Munhall,Pa. U5 ..... 82.00
Sharon,Pa. S3 ..... 82.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bartonville,Ill. K4 ... $82.00
Bessemer,Pa. U5 ..... 80.00
Buffalo R2 ..... 80.00
Clairton,Pa. U5 ..... 80.00
Ensley,Ala. T2 ..... 80.00
Fairfield,Ala. T2 ..... 80.00
Fontana,Calif. K1 ..... 90.50
Gary,Ind. U5 ..... 80.00
Johnstown,Pa. B2 ..... 80.00
Lackawanna,N.Y. B2 .. 80.00
Munhall,Pa. U5 ..... 80.00
Owensboro,Ky. G8 ..... 80.00
S.Chicago Ill. R2, U5 .. 80.00
S.Duquesne,Pa. U5 .... 80.00
Sterling,Ill. N15 ..... 80.00
Youngstown R2 ..... 80.00

Carbon, Forging (NT)
Bessemer,Pa. U5 ..... $99 50
Buffalo R2 ..... 99.50
Canton,O. R2 ..... 102.00
Clairton,Pa. U5 ..... 99.50
Conshohocken,Pa. A3 .. 104.50
Ensley,Ala. T2 ..... 99.50
Fairfield,Ala. T2 ..... 99.50
Farrell,Pa. S3 ..... 99.50
Fontana,Calif. K1 ..... 109.00
Gary,Ind. U5 ..... 99.50
Geneva,Utah C11 ..... 99.50
Houston S5 ..... 104.50
Johnstown,Pa. B2 ..... 99.50
Lackawanna,N.Y. B2 .. 99.50
LosAngeles B3 ..... 109.00
Midland,Pa. C18 ..... 99 50
Munhall,Pa. U5 ..... 99.50
Owensboro,Ky. G8 ..... 99.50
Seattle B3 ..... 109.00
Sharon,Pa. S3 ..... 99 50
S.Chicago R2, U5, W14 .. 99.50
S.Duquesne,Pa. U5 .... 99.50
S.SanFrancisco B3 .... 109.00
Warren,O. C17 ..... 99.50

Alloy, Forging (NT)
Bethlehem,Pa. B2 .. $119.00
Bridgeport,Conn. C32.. 119.00
Buffalo R2 ..... 119.00
Canton,O. R2, T7 .... 119.00
Conshohocken,Pa. A3.. 126.00
Detroit S41 ..... 119.00
Economy,Pa. B14 .... 119.00
Farrell,Pa. S3 ..... 119.00
Fontana,Calif. K1 .. 140.00
Gary,Ind. U5 ..... 119.00
Houston S5 ..... 124.00
Ind.Harbor,Ind. Y1 .. 119.00
Johnstown,Pa. B2 .... 119.00
Lackawanna,N.Y. B2.. 119.00
LosAngeles B3 ..... 139.00
Lowellville,O. S3 .... 119.00
Massillon,O. R2 .... 119.00
Midland,Pa. C18 .... 119.00
Munhall,Pa. U5 ..... 119.00
Owensboro,Ky G8 .. 119.00
Sharon Pa. S3 ..... 119.00
S.Chicago R2,U5,W14 .. 119.00
S.Duquesne,Pa. U5 .. 119.00
Struthers,O. Y1 ..... 119.00
Warren,O. C17 ..... 119.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 ..... $122.50
Canton,O. R2 ..... 125.00
Cleveland R2 ..... 122 50
Gary,Ind. U5 ..... 122.50
S.Chicago,Ill. R2, W14 122.50
S.Duquesne,Pa. U5 .. 122.50
Warren,O. C17 ..... 122.50

SKELP
Aliquippa,Pa. J5 ..... 5.05
Munhall,Pa. U5 ..... 5.05
Pittsburgh J5 ..... 5.05
Warren,O. R2 ..... 5.05
Youngstown R2, U5 .... 5.05

WIRE RODS
AlabamaCity,Ala. R2 .. 6.40
Aliquippa,Pa. J5 ..... 6.40
Alton,Ill. L1 ..... 6.60
Bartonville,Ill. K4 .... 6.50
Buffalo W12 ..... 6.40
Cleveland A7 ..... 6.40
Donora,Pa. A7 ..... 6.40
Fairfield,Ala. T2 ..... 6.40
Houston S5 ..... 6.65
IndianaHarbor,Ind. Y1.. 6.40
Johnstown,Pa. B2 .... 6.40
Joliet,Ill. A7 ..... 6.40
KansasCity,Mo. S5 .... 6.65
Kokomo,Ind. C16 ..... 6.50
LosAngeles B3 ..... 7.20
Minnequa,Colo. C10 .... 6.65
Monessen,Pa. P7 ..... 6.40
N Tonawanda,N.Y. B11.. 6.40
Pittsburg,Calif. C11 .... 7.20
Portsmouth,O. P12 .... 6.40
Roebling,N.J. R5 ..... 6.50
S.Chicago,Ill. R2, W14 .. 6.40
SparrowsPoint,Md. B2 .. 6.50
Sterling,Ill.(1) N15 .... 6.40
Sterling,Ill. N15 ..... 6 50
Struthers,O. Y1 ..... 6.40
Worcester,Mass. A7 .... 6.70

STRUCTURALS

Carbon Steel Std. Shapes
AlabamaCity,Ala. R2 .. 5.50
Aliquippa,Pa. J5 ..... 5.50
Atlanta A11 ..... 5.70
Bessemer,Ala. T2 ..... 5.50
Bethlehem,Pa. B2 ..... 5.55
Birmingham C15 ..... 5.50
Clairton Pa. U5 ..... 5 50
Fairfield,Ala. T2 ..... 5.50
Fontana,Calif. K1 .... 6.30
Gary,Ind. U5 ..... 5.50
Geneva,Utah C11 ..... 5.50
Houston S5 ..... 5.60
Ind.Harbor,Ind. I-2, Y1.5.50
Johnstown,Pa. B2 ..... 5.55
Joliet,Ill. P22 ..... 5.50
KansasCity,Mo. S5 .... 5.60
Lackawanna,N.Y. B2 .. 5.55
LosAngeles B3 ..... 6 20
Minnequa,Colo. C10 .... 5.80
Munhall,Pa. U5 ..... 5.50
Niles,Calif. P1 ..... 6.25
Phoenixville Pa. P4 .... 5.55
Portland,Oreg. O4 ..... 6.25
Seattle B3 ..... 6.25
S.Chicago,Ill. U5, W14.. 5.50
S.SanFrancisco B3 .... 6.75
Sterling,Ill. N15 ..... 5.50
Torrance,Calif. C11 .... 6.20
Weirton,W.Va. W6 .... 5.50

Wide Flange
Bethlehem,Pa. B2 ..... 5.55
Clairton,Pa. U5 ..... 5.50
Fontana,Calif. K1 .... 6.45
IndianaHarbor,Ind. I-2.. 5.50
Lackawanna,N.Y. B2 .. 5.55
Munhall,Pa. U5 ..... 5.50
Phoenixville,Pa. P4 .... 5.55
S.Chicago,Ill. U5 .... 5.50
Sterling,Ill. N15 ..... 5.50
Weirton,W.Va. W6 .... 5.50

Alloy Std. Shapes
Aliquippa,Pa. J5 ..... 6.80
Clairton,Pa. U5 ..... 6.80
Gary,Ind. U5 ..... 6.80
Houston S5 ..... 6.90
Munhall,Pa. U5 ..... 6.80
S.Chicago,Ill. U5, W14.. 6.80

H.S., L.A., Std. Shapes
Aliquippa,Pa. J5 ..... 8.05
Bessemer,Ala. T2 ..... 8.05
Bethlehem,Pa. B2 ..... 8.10
Clairton,Pa. U5 ..... 8.05
Fairfield,Ala. T2 ..... 8.05
Fontana,Calif. K1 ..... 8.85
Gary,Ind. U5 ..... 8.05
Geneva,Utah C11 ..... 8.05
Houston S5 ..... 8.15
Ind.Harbor,Ind. I-2, Y1.8.05
Johnstown,Pa. B2 ..... 8.10
KansasCity,Mo. S5 .... 8.15
Lackawanna,N.Y. B2 .. 8.10
LosAngeles B3 ..... 8.75
Munhall,Pa. U5 ..... 8.05
Seattle B3 ..... 8.80
S.Chicago,Ill. U5, W14.. 8.05
S.SanFrancisco B3 .... 8.70
Sterling,Ill. N15 ..... 7.75
Struthers,O. Y1 ..... 8.05

H.S., L.A., Wide Flange
Bethlehem,Pa. B2 ..... 8.10
Ind.Harbor,Ind. I-2 .... 8.05
Lackawanna,N.Y. B2 .. 8.10
Munhall,Pa. U5 ..... 8.05
S.Chicago,Ill. U5 ..... 8.05
Sterling,Ill. N15 ..... 7.75

PILING

BEARING PILES
Bethlehem,Pa. B2 ..... 5.55
Ind.Harbor,Ind. I-2 .... 5.50
Lackawanna,N.Y. B2 .. 5.55
Munhall,Pa. U5 ..... 5.50
S.Chicago, Ill. I-2, U5 .. 5.50

STEEL SHEET PILING
Ind.Harbor,Ind. I-2 .... 6.50
Lackawanna,N.Y. B2 .. 6.50
Munhall,Pa. U5 ..... 6.50
S.Chicago,Ill. I-2, U5 .. 6.50
Weirton,W.Va. W6 .... 6.50

PLATES

PLATES, Carbon Steel
AlabamaCity,Ala. R2 .. 5.30
Aliquippa,Pa. J5 ..... 5.30
Ashland,Ky.(15) A10 .. 5.30
Atlanta A11 ..... 5.50
Bessemer,Ala. T2 ..... 5.30
Clairton,Pa. U5 ..... 5.30
Claymont,Del. C22 .... 5.30
Cleveland J5, R2 ..... 5.30
Coatesville,Pa. L7 ..... 5.30
Conshohocken,Pa. A3 .. 5.30
Ecorse,Mich. G5 ..... 5.30
Fairfield,Ala. T2 ..... 5.30
Farrell,Pa. S3 ..... 5.30
Fontana,Calif.(30)K1 .. 6.10
Gary,Ind. U5 ..... 5.30
Geneva,Utah C11 ..... 5.30
GraniteCity,Ill. G4 .... 5.40
Harrisburg,Pa. P4 ..... 5.30
Houston S5 ..... 5.40
Ind.Harbor,Ind. I-2, Y1.5.30
Johnstown,Pa. B2 ..... 5.30
Lackawanna,N.Y. B2 .. 5.30
Mansfield,O. E6 ..... 5.30
Minnequa,Colo. C10 .... 6.15
Munhall,Pa. U5 ..... 5.30
Newport,Ky. A2 ..... 5.30
Pittsburgh J5 ..... 5.30
Riverdale,Ill. A1 ..... 5.30
Seattle B3 ..... 6.20
Sharon,Pa. S3 ..... 5.30
S.Chicago Ill. U5, W14.. 5.30
SparrowsPoint,Md. B2 .. 5.30
Sterling,Ill. N15 ..... 5.30
Steubenville,O. W10 .... 5.30
Warren,O. R2 ..... 5.30
Youngstown U5, Y1 .... 5.30
Youngstown (27) R2 .. 5.30

PLATES, Carbon Abras. Resist.
Claymont,Del. C22 .... 7 05
Fontana,Calif. K1 ..... 7.85
Geneva,Utah C11 ..... 7 05
Houston S5 ..... 7.15
Johnstown,Pa. B2 ..... 7.05
SparrowsPoint,Md. B2 .. 7.05

PLATES, Wrought Iron
Economy,Pa. B14 .... 13.55

PLATES, H.S., L.A.
Aliquippa,Pa. J5 ..... 7.95
Ashland,Ky. A10 ..... 7.95
Bessemer,Ala. T2 ..... 7.95
Clairton,Pa. U5 ..... 7.95
Claymont,Del. C22 ..... 7.95
Cleveland J5, R2 ..... 7.95
Coatesville,Pa. L7 ..... 7.95
Conshohocken,Pa. A3 .. 7 95
Economy Pa. B14 ..... 7.95
Ecorse,Mich. G5 ..... 7.95
Fairfield,Ala. T2 ..... 7.95
Farrell,Pa. S3 ..... 7.95
Fontana,Calif(30) K1 .. 8.75
Gary,Ind. U5 ..... 7.95
Geneva,Utah C11 ..... 7.95
Houston S5 ..... 8.05
Ind.Harbor,Ind. I-2, Y1. 7.95
Johnstown,Pa. B2 ..... 7.95
Munhall,Pa. U5 ..... 7.95
Pittsburgh J5 ..... 7.95
Seattle B3 ..... 8.85
Sharon,Pa. S3 ..... 7.95
S.Chicago,Ill. U5 W14 .. 7.95
SparrowsPoint,Md. B2 .. 7.95
Warren,O. R2 ..... 7.95
Youngstown U5, Y1 .... 7.95

PLATES, Alloy
Aliquippa,Pa. J5 ..... 7.50
Claymont,Del. C22 .... 7.50
Coatesville,Pa. L7 ..... 7.50
Economy,Pa. B14 ..... 7.50
Farrell,Pa. S3 ..... 7.50
Fontana,Calif. K1 ..... 8.30
Gary,Ind. U5 ..... 7.50
Houston S5 ..... 7.60
Ind.Harbor,Ind. Y1 .... 7.50
Johnstown,Pa. B2 ..... 7.50
Lowellville,O. S3 ..... 7.50
Munhall,Pa. U5 ..... 7.50
Newport,Ky. A2 ..... 7.50
Pittsburgh J5 ..... 7.50
Seattle B3 ..... 8.40
Sharon,Pa. S3 ..... 7.50
S.Chicago,Ill. U5, W14.. 7.50
SparrowsPoint,Md. B2 .. 7.50
Youngstown Y1 ..... 7.50

FLOOR PLATES
Cleveland J5 ..... 6.375
Conshohocken,Pa. A3 .. 6.375
Ind.Harbor,Ind. I-2 .. 6.375
Munhall,Pa. U5 ..... 6.375
Pittsburgh J5 ..... 6.375
S.Chicago,Ill. U5 ..... 6.375

PLATES, Ingot Iron
Ashland c.l.(15) A10 .. 5.55
Ashland l.c.l.(15) A10 .. 6.05
Cleveland c.l. R2 ..... 6.05
Warren,O. c.l. R2 ..... 6.05

BARS

BARS, Hot-Rolled Carbon (Merchant Quality)
Ala.City,Ala.(9) R2 .. 5.675
Aliquippa,Pa. (9) J5 .. 5.675
Alton,Ill. L1 ..... 5.875
Atlanta(9) A11 ..... 5.875
Bessemer,Ala.(9) T2 .. 5.675
Birmingham(9) C15 .. 5.675
Buffalo(9) R2 ..... 5.675
Canton,O. (23) R2 .... 6.15
Clairton,Pa.(9) U5 .. 5.675
Cleveland(9) R2 ..... 5.675
Ecorse,Mich.(9) G5 .... 5.675
Emeryville,Calif. J7 .... 6.425
Fairfield,Ala.(9) T2 .. 5.675
Fairless,Pa.(9) U5 .... 5.825
Fontana,Calif.(9) K1 .. 6.375
Gary,Ind.(9) U5 ..... 5.675
Houston(9) S5 ..... 5.925
Ind.Harbor(9) I-2, Y1.5.675
Johnstown,Pa.(9) B2 .. 5.675
Joliet,Ill. P22 ..... 5.675
KansasCity,Mo.(9) S5.. 5.925
Lackawanna(9) B2 .... 5.675
LosAngeles(9) B3 .... 6.375
Massillon,O. (23) R2 .. 6.15
Midland,Pa.(23) C18 .. 6.025
Milton,Pa. M18 ..... 5.825
Minnequa,Colo. C10 .. 6.125
Niles,Calif. P1 ..... 6.375
N.T'wan'a,N.Y.(23)B11 6.025
Owensboro Ky.(9) G8 .. 6.025
Pittsburg,Calif.(9) C11.6.375
Pittsburgh(9) J5 ..... 5.675
Portland,Oreg. O4 .... 6.425
Riverdale,Ill.(9) A1 .. 5.675
Seattle A24, B3, N14 .. 6.425
S.Ch'c'go(9)R2,U5,W14 5.675
S.Duquesne,Pa.(9) U5.. 5.675
S.SanFran.,Calif.(9)B3 6.425
Sterling,Ill.(1)(9) N15.. 5.675
Sterling,Ill.(9) N15 .... 5.775
Struthers,O.(9) Y1 .... 5.675
Tonawanda N.Y. B12 .. 5.675
Torrance,Calif.(9) C11.6.375
Warren,O. C17 ..... 6.025
Youngstown(9) R2, U5.5.675

BARS, Hot-Rolled Alloy
Aliquippa,Pa. J5 ..... 6.725
Bethlehem,Pa. B2 .... 6.725
Bridgeport,Conn. C32 .. 6.80
Buffalo R2 ..... 6.725
Canton,O. R2 T7 .... 6 725
Clairton,Pa. U5 ..... 6.725
Detroit S41 ..... 6.725
Economy,Pa. B14 ..... 6.725
Ecorse,Mich. G5 ..... 6.725
Fairless Pa. U5 ..... 6.875
Farrell,Pa. S3 ..... 6.725
Fontana,Calif. K1 ..... 7.775
Gary,Ind. U5 ..... 6.725
Houston S5 ..... 6.975
Ind.Harbor,Ind. I-2, Y1.6.725
Johnstown,Pa. B2 .... 6.725
KansasCityMo. S5 .... 6.975
Lackawanna,N.Y. B2 .. 6.725
LosAngeles B3 ..... 7.775
Lowellville O. S3 ..... 6.725
Massillon,O. R2 ..... 6.725
Midland,Pa. C18 ..... 6.725
Owensboro,Ky. G8 .... 6.725
Pittsburgh J5 ..... 6.725
Sharon,Pa. S3 ..... 6.725
S.Chicago R2, U5, W14 6.725
S.Duquesne,Pa. U5 .... 6.725
Struthers,O. Y1 ..... 6 725
Warren,O. C17 ..... 6.725
Youngstown U5 ..... 6.725

BARS & SMALL SHAPES, H.R. High-Strength, Low-Alloy
Aliquippa,Pa. J5 ..... 8.30
Bessemer,Ala. T2 ..... 8.30
Bethlehem,Pa. B2 ..... 8.30
Clairton,Pa. U5 ..... 8.30
Cleveland R2 ..... 8.30
Ecorse,Mich. G5 ..... 8.30
Fairfield,Ala. T2 ..... 8.30
Fontana,Calif. K1 ..... 9.00
Gary,Ind. U5 ..... 8.30
Houston S5 ..... 8.55
Ind.Harbor,Ind. Y1 .... 8.30
Johnstown,Pa. B2 ..... 8.30
KansasCity,Mo. S5 .... 8.55
Lackawanna,N.Y. B2 .. 8.30
LosAngeles B3 ..... 9.00
Pittsburgh J5 ..... 8.30
Seattle B3 ..... 9.05
S.Chicago,Ill. R2, W14.. 8.30
S.Duquesne,Pa. U5 .... 8.30
S.SanFrancisco B3 .... 9.05
Struthers,O. Y1 ..... 8.30
Youngstown U5 ..... 8.30

BAR SIZE ANGLES; H.R. Carbon
Bethlehem,Pa.(9) B2 .. 5.825
Houston(9) S5 ..... 5.925
KansasCity,Mo.(9)S5 .. 5.925
Lackawanna(9) B2 .... 5.675
Sterling,Ill. N15 ..... 5.775
Sterling,Ill.(1) N15 .... 5.675
Tonawanda,N.Y. B12 .. 5.675

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 ..... 5.675
Atlanta A11 ..... 5.875
Joliet,Ill. P22 ..... 5.675
Minnequa,Colo. C10 .. 6.125
Niles,Calif. P1 ..... 6.375
Pittsburgh J5 ..... 5.675
Portland,Oreg. O4 .... 6.425
SanFrancisco S7 ..... 6 52
Seattle B3 ..... 6.425

BAR SHAPES, Hot-Rolled Alloy
Aliquippa,Pa. J5 ..... 6.80
Clairton,Pa. U5 ..... 6.80
Gary,Ind. U5 ..... 6.80
Houston S5 ..... 7.05
KansasCity,Mo. S5 .... 7.05
Pittsburgh J5 ..... 6.80
Youngstown U5 ..... 6.80

BARS, C.F. Leaded (Including leaded extra)
Carbon
LosAngeles P2. S30 .. 11.75*

Alloy
Ambridge,Pa. W18 .. 10.175
BeaverFalls,Pa. M12 .. 10.175
Camden,N.J. P13 ..... 10.35
Chicago W18 ..... 10.175
Elyria,O. W8 ..... 10.175
Monaca,Pa. S17 ..... 10.175
Newark,N.J. W18 ..... 10.35
SpringCity,Pa. K3 .... 10.35

*Grade A: add 0.05c for Grade B.

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 .... 7.65
BeaverFalls,Pa. M12,R2. 7.65
Birmingham C15 ..... 8.25
Buffalo B5 ..... 7.70
Camden,N.J. P13 ..... 8.10
Carnegie,Pa. C12 ..... 7.65
Chicago W18 ..... 7.65
Cleveland A7, C20 ..... 7.65
Detroit B5, P17 ..... 7.85
Detroit S41 ..... 7.65
Donora,Pa. A7 ..... 7.65
Elyria,O. W8 ..... 7.65
FranklinPark,Ill. N5 .... 7.65
Gary,Ind. R2 ..... 7.65
GreenBay,Wis. F7 ..... 7.65
Hammond Ind. J5, L2 .. 7.65
Hartford,Conn. R2 .... 8.15
Harvey,Ill. B5 ..... 7.65
LosAngeles(49) S30 .... 9.10
LosAngeles(49) P2, R2.9.10
Mansfield,Mass. B2 .... 8.20
Massillon,O. R2, R8 .... 7.65
Midland,Pa. C18 ..... 7.65
Monaca,Pa. S17 ..... 7.65
Newark,N.J. W18 ..... 8.10
NewCastle,Pa.(17) B4 .. 7.65
Pittsburgh J5 ..... 7.65
Plymouth,Mich. P5 .... 7.90
Putnam,Conn. W18 .... 8.20
Readville,Mass. C14 .... 8.20
S.Chicago,Ill. W14 .... 7.65
SpringCity,Pa. K3 .... 8.10
Struthers,O. Y1 ..... 7.65
Warren,O. C17 ..... 7.65
Waukegan,Ill. A7 ..... 7.65
Willimantic,Conn. J5 .... 8.15
Youngstown F3, Y1 .... 7.65

BARS, Cold-Finished Carbon (Turned and Ground)
Cumberland,Md.(5) C19 6.55

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 .... 9.025
BeaverFalls,Pa.M12,R2 9.025
Bethlehem,Pa. B2 .... 9.025
Bridgeport,Conn. C32.. 9.175
Buffalo B5 ..... 9.025
Camden,N.J. P13 ..... 9.20
Canton,O. T7 ..... 9.025
Carnegie,Pa. C12 ..... 9.025
Chicago W18 ..... 9.025
Cleveland A7, C20 .... 9.025
Detroit B5, P17 ..... 9.225
Detroit S41 ..... 9.025
Donora,Pa. A7 ..... 9.025
Elyria,O. W8 ..... 9.025
FranklinPark,Ill. N5 .. 9.025
Gary,Ind. R2 ..... 9.025
GreenBay,Wis. F7 .... 9.025
Hammond,Ind. J5 L2.. 9.025
Hartford,Conn. R2 .... 9.325
Harvey,Ill. B5 ..... 9.025
Lackawanna,N.Y. B2 .. 9.025
LosAngeles P2, S30 ... 11.00
Mansfield,Mass. B5 .. 9.325
Massillon,O. R2, R8 .. 9.025
Midland,Pa. C18 .... 9.025
Monaca,Pa. S17 ..... 9.025
Newark,N.J. W18 ..... 9.20
Plymouth,Mich. P5 .... 9.225
S.Chicago, Ill. W14 .. 9.025
SpringCity,Pa. K3 .... 9.20
Struthers,O. Y1 ..... 9.025
Warren,O. C17 ..... 9.025
Waukegan,Ill. A7 ..... 9.025
Willimantic,Conn. J5 .. 9.325
Worcester,Mass. A7 .. 9.325
Youngstown F3, Y1 .... 9.025

BARS, Reinforcing, Billet (To Fabricators)

AlabamaCity,Ala. R2 ..5.675
Atlanta A11 .....5.675
Birmingham C15 .....5.675
Buffalo R2 .....5.675
Cleveland R2 .....5.675
Ecorse,Mich. G5 .....5.675
Emeryville,Calif. J7 ..6.425
Fairfield,Ala. T2 .....5.675
Fairless,Pa. U5 .....5.825
Fontana,Calif. K1 ....6.375
Ft.Worth,Tex(4)(26)T4 5.925
Gary,Ind. U5 .....5.675
Houston S5 .....5.925
Ind.Harbor,Ind. I-2, Y1 5.675
Johnstown,Pa. B2 ....5.675
Joliet,Ill. P22 .....5.675
KansasCity,Mo. S5 ...5.925
Kokomo,Ind. C16 ....5.775
Lackawanna,N.Y. B2 ..5.675
LosAngeles B3 .....6.375
Madison,Ill. L1 .....5.875
Milton,Pa. M18 .....5.825
Minnequa,Colo. C10 ..6.125
Niles,Calif. P1 .....6.375
Pittsburg,Calif. C11 ..6.375
Pittsburgh J5 .....5.675
Portland,Oreg. O4 ....6.425
SandSprings,Okla. S5 ..5.925
Seattle A24, B3, N14 ..6.425
S.Chicago,Ill. R2, W14 5.675
S.Duquesne,Pa. U5 ...5.675
S.SanFrancisco B3 ....6.425
SparrowsPoint,Md. B2..5.675
Sterling,Ill.(1) N15 ...5.675
Sterling,Ill. N15 .....5.775
Struthers,O. Y1 .....5.675
Tonawanda,N.Y. B12 ..6.10
Torrance,Calif. C11 ..6.375
Youngstown R2, U5 ..5.675

BARS, Reinforcing, Billet (Fabricated To Consumers)

Baltimore B2 .....7.42
Boston B2, U8 .....8.15
Chicago U8 .....7.41
Cleveland U8 .....7.39
Houston S5 .....7.60
Johnstown,Pa. B2 ....7.33
KansasCity,Mo. S5 ....7.60
Lackawanna,N.Y. B2 ..7.35
Marion,O. P11 .....6.70
Newark,N.J. U8 .....7.80
Philadelphia U8 .....7.63
Pittsburgh J5, U8 ....7.35
SandSprings,Okla. S5 ..7.60
Seattle A24, B3, N14 ..7.95
SparrowsPt,Md. B2 ..7.33
St.Paul U8 .....8.17
Williamsport,Pa. S19 ..7.25

BARS, Wrought Iron

Economy,Pa.(S.R.)B14 14.90
Economy,Pa.(D.R.)B14 18.55
Economy(Staybolt) B14 19.00
McK.Rks.(S.R.) L5 ..14.50
McK.Rks.(D.R.) L5 ..19.80
McK.Rks.(Staybolt)L5 20.95

BARS, Rail Steel

ChicagoHts.(3) C2, I-2 5.575
ChicagoHts.(4) (44) I-2 5.675
ChicagoHts.(4) C2 ...5.675
Franklin,Pa. (3) F5 ..5.575
Franklin,Pa. (4)F5 ..5.675
JerseyShore,Pa.(3) J8 ..5.55
Marion,O.(3) P11 ....5.575
Tonawanda(3) B12 ...5.575
Tonawanda(4) B12 ....6.10

SHEETS

SHEETS, Hot-Rolled Steel (18 Gage and Heavier)

AlabamaCity,Ala. R2 ..5.10
Allenport,Pa. P7 .....5.10
Aliquippa,Pa. J5 .....5.10
Ashland,Ky.(8) A10 ...5.10
Cleveland J5, R2 .....5.10
Conshohocken,Pa. A3 ..5.15
Detroit(8) M1 .....5.10
Ecorse,Mich. G5 .....5.10
Fairfield,Ala. T2 .....5.10
Fairless,Pa. U5 .....5.15
Farrell,Pa. S3 .....5.10
Fontana,Calif. K1 ....5.825
Gary,Ind. U5 .....5.10
Geneva,Utah C11 .....5.20
GraniteCity,Ill.(8) G4 ..5.20
Ind.Harbor,Ind. I-2, Y1.5.10
Irvin,Pa. U5 .....5.10
Lackawanna,N.Y. B2 ..5.10
Mansfield,O. E6 .....5.10
Munhall,Pa. U5 .....5.10
Newport,Ky. A2 .....5.10
Niles,O. M21, S3 .....5.10
Pittsburg,Calif. C11 ....5.80
Pittsburgh J5 .....5.10
Portsmouth,O. P12 ....5.10
Riverdale,Ill. A1 .....5.10
Sharon,Pa. S3 .....5.10
S.Chicago,Ill. U5, W14..5.10
SparrowsPoint,Md. B2 ..5.10
Steubenville,O. W10 ....5.10
Warren,O. R2 .....5.10
Weirton,W.Va. W6 ....5.10
Youngstown U5, Y1 ....5.10

SHEETS, H.R. (19 Ga. & Lighter)

Niles,O. M21, S3 ....6.275

SHEETS, H.R., Alloy

Gary,Ind. U5 .....8.40
Ind.Harbor,Ind. Y1 ....8.40
Irvin,Pa. U5 .....8.40
Munhall,Pa. U5 .....8.40
Newport,Ky. A2 .....8.40
Youngstown U5, Y1 ....8.40

SHEETS, H.R. (14 Ga. & Heavier) High-Strength, Low-Alloy

Aliquippa,Pa. J5 ....7.525
Ashland,Ky. A10 ....7.525
Cleveland J5, R2 .....7.525
Conshohocken,Pa. A3 ..7.575
Ecorse,Mich. G5 .....7.525
Fairfield,Ala. T2 .....7.525
Fairless,Pa. U5 .....7.575
Farrell,Pa. S3 .....7.525
Fontana,Calif. K1 ....8.25
Gary,Ind. U5 .....7.525
Ind.Harbor,Ind. I-2, Y1 7.525
Irvin,Pa. U5 .....7.525
Lackawanna(35) B2 ..7.525
Munhall,Pa. U5 .....7.525
Niles,O. S3 .....7.525
Pittsburgh J5 .....7.525
S.Chicago,Ill. U5, W14 7.525
Sharon,Pa. S3 .....7.525
SparrowsPoint(36) B2..7.525
Warren,O. R2 .....7.525
Weirton,W.Va. W6 ....7.525
Youngstown U5, Y1 ..7.525

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky.(8) A10 ...5.35
Cleveland R2 .....5.875
Warren,O. R2 .....5.875

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 .....7.05
Middletown,O. A10 ....6.775
Warren,O. R2 .....7.05

SHEETS, Cold-Rolled Steel (Commercial Quality)

AlabamaCity,Ala. R2 .6.275
Allenport,Pa. P7 .....6.275
Aliquippa,Pa. J5 .....6.275
Cleveland J5, R2 .....6.275
Conshohocken,Pa. A3..6.325
Detroit M1 .....6.275
Ecorse,Mich. G5 .....6.275
Fairfield,Ala. T2 .....6.275
Fairless,Pa. U5 .....6.325
Follansbee,W.Va. F4 ..6.275
Fontana,Calif. K1 ....7.40
Gary,Ind. U5 .....6.275
GraniteCity,Ill. G4 ....6.375
Ind.Harbor,Ind. I-2, Y1 6.275
Irvin,Pa. U5 .....6.275
Lackawanna,N.Y. B2..6.275
Mansfield,O. E6 .....6.275
Middletown,O. A10 ....6.275
Newport,Ky. A2 .....6.275
Pittsburg,Calif. C11 ..7.225
Pittsburgh J5 .....6.275
Portsmouth,O. P12 ....6.275
SparrowsPoint,Md. B2.6.275
Steubenville,O. W10 ..6.275
Warren,O. R2 .....6.275
Weirton,W.Va. W6 ....6.275
Yorkville,O. W10 .....6.275
Youngstown Y1 .....6.275

SHEETS, Cold-Rolled, High-Strength, Low-Alloy

Aliquippa,Pa. J5 ....9.275
Cleveland J5, R2 ....9.275
Ecorse,Mich. G5 .....9.275
Fairless,Pa. U5 .....9.325
Fontana,Calif. K1 ....10.40
Gary,Ind. U5 .....9.275
Ind.Harbor,Ind. I-2, Y1 9.275
Lackawanna(37) B2 ..9.275
Pittsburgh J5 .....9.275
SparrowsPoint(38) B2..9.275
Warren,O. R2 .....9.275
Weirton,W.Va. W6 ...9.275
Youngstown Y1 .....9.275

SHEETS, Culvert

	Cu Steel	Cu Fe
Ala.City,Ala. R2	7.225	....
Ashland,Ky. A10	7.225	7.475
Canton,O. R2	7.225	7.75
Fairfield T2	7.225	7.475
Gary,Ind. U5	7.225	7.475
GraniteCity,Ill.G4	7.325	....
Ind.Harbor I-2	7.225	7.475
Irvin,Pa. U5	7.225	7.475
Kokomo,Ind. C16	7.325	....
MartinsFry. W10	7.225	7.475
Pitts.,Calif. C11	7.975	....
Pittsburgh J5	7.225	....
SparrowsPt. B2	7.225	....

SHEETS, Culvert—Pure Iron

Ind.Harbor,Ind. I-2 ...7.475

SHEETS, Galvanized Steel Hot-Dipped

AlabamaCity,Ala. R2 .6.875‡
Ashland,Ky. A10 ...6.875†
Canton,O. R2 .....6.875‡
Dover,O. E6 .....6.875†
Fairfield,Ala. T2 ...6.875†
Gary,Ind. U5 .....6.875†
GraniteCity,Ill. G4 ...6.975*
Ind Harbor,Ind. I-2 ..6.875†
Irvin,Pa. U5 .....6.875†
Kokomo,Ind. C16 ....6.975‡
MartinsFerry,O. W10 6.875*
Middletown,O. A10 ...6.875†
Pittsburg,Calif. C11 ..7.625*
Pittsburgh J5 .....6.875†
SparrowsPt.,Md. B2 ..6.875‡
Warren,O. R2 .....6.875†
Weirton,W.Va. W6 ...6.875*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Well Casing

Fontana,Calif. K1 ....7.325

SHEETS, Galvanized High-Strength, Low-Alloy

Irvin,Pa. U5 .....10.125
Pittsburgh J5 .....10.125
SparrowsPt.(39) B2 ..10.025

SHEETS, Galvannealed Steel

Canton,O. R2 .....7.275
Irvin,Pa. U5 .....7.275

SHEETS, Galvanized Ingot Iron (Hot-Dipped Continuous)

Ashland,Ky. A10 ....7.125
Middletown,O. A10 ....7.125

SHEETS, Electrogalvanized

Cleveland(28) B2 .....7.65
Niles,O.(28) R2 .....7.65
Weirton,W.Va. W6 ....7.50
Youngstown J5 .....7.50

SHEETS, Aluminum Coated

Butler,Pa. A10 (type 1) 9.525
Butler,Pa. A10 (type 2) 9.625

SHEETS, Enameling Iron

Ashland,Ky. A10 ....6.775
Cleveland R2 .....6.775
Fairfield,Ala. T2 ....6.775
Gary,Ind. U5 .....6.775
GraniteCity,Ill. G4 ....6.875
Ind.Harbor,Ind. I-2, Y1 6.775
Irvin,Pa. U5 .....6.775
Middletown,O. A10 ....6.775
Niles,O. M21, S3 .....6.775
Youngstown Y1 .....6.775

BLUED STOCK, 29 Gage

Dover,O. E6 .....8.70
Follansbee,W.Va. F4 ...8.70
Ind.Harbor,Ind. I-2 ....8.70
Mansfield,O. E6 .....8.70
Warren,O. R2 .....8.70
Yorkville,O. W10 .....8.70

SHEETS, Long Terne, Steel (Commercial Quality)

BeechBottom,W.Va.W10 7.225
Gary,Ind. U5 .....7.225
Mansfield,O. E6 .....7.225
Middletown,O. A10 ....7.225
Niles,O. M21, S3 .....7.225
Warren,O. R2 .....7.225
Weirton,W.Va. W6 ....7.225

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 ....7.625

Key To Producers

A1 Acme Steel Co.
A2 Acme-Newport Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Div., H. K. Porter Co. Inc.
A6 American Shim Steel Co.
A7 American Steel & Wire Div., U. S. Steel Corp.
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A24 Alaska Steel Mills Inc.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div., Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel Div., U. S. Steel Corp.
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div., H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Plant, Wickwire Spencer Steel Div., Colo. Fuel & Iron
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.
C32 Carpenter Steel of N.Eng.
D2 Detroit Steel Corp.
D4 Disston Div., H. K. Porter Co. Inc.
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E5 Elliott Bros. Steel Co.
E6 Empire-Reeves Steel Corp.
E10 Enamel Prod. & Plating

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.
G8 Green River Steel Corp.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins Steel Tube Works
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L6 Lone Star Steel Co.
L7 Lukens Steel Co.
L8 Leschen Wire Rope Div., H. K. Porter Co. Inc.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M14 McInnes Steel Co.
M16 Md. Fine & Specialty Wire Co. Inc.
M17 Metal Forming Corp.
M18 Milton Steel Div., Merritt-Chapman&Scott
M21 Mallory-Sharon Metals Corp.
M22 Mill Strip Products Co.

N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div., U. S. Steel Corp.
N5 Nelsen Steel & Wire Co.
N6 New England High Carbon Wire Co.
N8 Newman-Crosby Steel
N14 Northwest. Steel Rolling Mills Inc.
N15 Northwestern S.&W. Co.
N20 Neville Ferro Alloy Co.

O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Steel Corp.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke&Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Div., Detroit Steel Corp.
P13 Precision Drawn Steel
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., American Chain & Cable
P17 Plymouth Steel Corp.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.
P24 Phil. Steel & Wire Corp.

R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R8 Reliance Div., Eaton Mfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Div., Copperweld Steel Co.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Prod.
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
S40 Seneca Steel Service
S41 Stainless & Strip Div., J&L Steel Corp.
S42 Southern Elec. Steel Co.
S43 Seymour Mfg. Co.
S44 Screw & Bolt Corp. of America
T2 Tenn. Coal & Iron Div., U. S. Steel Corp.
T3 Tenn. Products & Chemical Corp.
T4 Texas Steel Co.
T5 Thomas Strip Div., Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
T13 Tube Methods Inc.
T19 Techalloy Co. Inc.

U3 Union Wire Rope Corp.
U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U. S. Steel Supply Div., U. S. Steel Corp.
U11 Union Carbide Metals Co.
U13 Union Steel Corp.

V2 Vanadium-Alloys Steel
V3 Vulcan-Kidd Steel Div., H. K. Porter Co.

W1 Wallace Barnes Steel Div., Associated Spring Corp.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W8 Western Automatic Machine Screw Co.
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
Y1 Youngstown Sheet & Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2 ...5.10
Allenport Pa. P7 .....5.10
Alton,Ill. L1 .....5.30
Ashland,Ky.(8) A10 ....5.10
Atlanta A11 .....5.10
Bessemer.Ala. T2 .....5.10
Birmingham C15 .....5.10
Buffalo(27) R2 .....5.10
Conshohocken,Pa. A3 ..5.15
Detroit M1 .....5.10
Ecorse,Mich. G5 .....5.10
Fairfield.Ala. T2 .....5.10
Farrell,Pa. S3 .....5.10
Fontana,Calif. K1 ....5.825
Gary,Ind. U5 .....5.10
Ind.Harbor,Ind. I-2, Y1..5.10
Johnstown,Pa.(25) B2 ..5.10
Lackaw'na,N.Y.(25) B2.5.10
LosAngeles(25) B3 .....5.85
LosAngeles C1 .....8.60
Minnequa Colo. C10 ....6.20
Riverdale,Ill. A1 .....5.10
SanFrancisco S7 .....6.60
Seattle(25) B3 .....6.10
Seattle N14 .....6.60
Sharon,Pa. S3 .....5.10
S.Chicago W14 .....5.10
S.SanFrancisco(25) B3..5.85
SparrowsPoint,Md. B2 ..5.10
Torrance,Calif. C11 ....5.85
Warren.O. R2 .....5.10
Weirton W.Va. W6 .....5.10
Youngstown U5 .....5.10

STRIP, Hot-Rolled Alloy

Carnegie,Pa. S18 .....8.40
Farrell,Pa. S3 .....8.40
Gary,Ind. U5 .....8.40
Houston S5 .....8.65
Ind.Harbor,Ind. Y1 ....8.40
KansasCity,Mo. S5 .....8.65
LosAngeles B3 .....9.60
Lowellville.O. S3 .....8.40
Newport,Ky. A2 .....8.40
Sharon,Pa. A2, S3 ....8.40
S.Chicago,Ill. W14 ....8.40
Youngstown U5, Y1 ...8.40

STRIP, Hot-Rolled High-Strength, Low-Alloy

Ashland,Ky. A10 .....7.575
Bessemer Ala. T2 .....7.575
Conshohocken,Pa. A3 ..7.575
Ecorse,Mich. G5 .....7.575
Fairfield,Ala. T2 .....7.575
Farrell,Pa. S3 .....7.575
Gary,Ind. U5 .....7.575
Ind.Harbor Ind. I-2, Y1.7.575
Lackawanna,N.Y. B2 ..7.575
LosAngeles(25) B3 ....8.325
Seattle(25) B3 .....8.575
Sharon,Pa. S3 .....7.575
S.Chicago,Ill. W14 ....7.575
S.SanFrancisco(25) B3.8.325
SparrowsPoint,Md. B2 .7.575
Warren.O. R2 .....7.575
Weirton,W.Va. W6 ....7.575
Youngstown U5, Y1 ...7.575

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10 ....5.35
Warren.O. R2 .....5.875

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6 .....7.425
Baltimore T6 .....7.425
Boston T6 .....7.975
Buffalo S40 .....7.425
Cleveland A7, J5 .....7.425
Dearborn,Mich. S3 ....7.425
Detroit D2 M1, P20...7.425
Dover,O. G6 .....7.425
Evanston,Ill. M22 .....7.525
Farrell,Pa. S3 .....7.425
Follansbee,W.Va. F4 ..7.425
Fontana,Calif. K1 .....9.20
FranklinPark Ill. T6 ..7.525
Ind.Harbor,Ind. Y1 ...7.425
Indianapolis S41 .....7.575
LosAngeles C1, S41 ....9.30
McKeesport,Pa. E10 ...7.525
NewBedford,Mass. R10.7.875
NewBritain,Conn. S15..7.875
NewCastle,Pa. B4, E5..7.425
NewHaven,Conn. D2 ...7.875
NewKensington,Pa. A6.7.425
Pawtucket,R.I. R3 ....7.975
Pawtucket,R.I. N8 ....7.975
Philadelphia P24 .....7.875
Pittsburgh J5 .....7.425
Riverdale,Ill. A1 .....7.525
Rome,N.Y.(32) R6 ....7.425
Sharon Pa. S3 .....7.425
Trenton,N.J.(31) R5 ..8.875
Wallingford,Conn. W2..7.875
Warren,O. R2, T5 .....7.425
Worcester,Mass. A7 ...7.975
Youngstown S41, Y1 ..7.425

STRIP, Cold-Rolled Alloy

Boston T6 .....15.90
Carnegie,Pa. S18 .....15.55
Cleveland A7 .....15.55
Dover,O. G6 .....15.55
Farrell,Pa. S3 .....15.55
FranklinPark,Ill. T6 ..15.55
Harrison,N.J. C18 ....15.55
Indianapolis S41 .....15.70
LosAngeles S41 .....17.75
Lowellville,O. S3 .....15.55
Pawtucket,R.I. N8 ....15.90
Riverdale,Ill. A1 .....15.55
Sharon,Pa. S3 .....15.55
Worcester,Mass. A7 ...15.85
Youngstown S41, Y1 ..7.425

STRIP, Cold-Rolled High-Strength, Low-Alloy

Cleveland A7 .....10.80
Dearborn,Mich. S3 ....10.80
Dover,O. G6 .....10.80
Farrell Pa. S3 .....10.80
Ind Harbor,Ind. Y1 ...10.80
Sharon,Pa. S3 .....10.80
Warren,O. R2 .....10.80

STRIP, Cold-Finished Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	9.50	10.70	12.90	15.90	18.85
Boston T6	9.50	10.70	12.90	15.90	18.85
Bristol,Conn. W1	...	10.70	12.90	16.10	19.30
Carnegie Pa. S18	8.95	10.40	12.60	15.60	....
Cleveland A7	8.95	10.40	12.60	15.60	18.55
Dearborn,Mich. S3	9.05	10.50	12.70	....	....
Detroit D2	9.05	10.50	12.70	15.70	....
Dover,O. G6	8.95	10.40	12.60	15.60	18.55
Evanston,Ill. M22	8.95	10.40	12.60	15.60	....
Farrell,Pa. S3	8.95	10.40	12.60	15.60	18.55
Fostoria,O. S1	10.05	10.40	12.60	15.60	....
FranklinPark.Ill. T6	9.05	10.40	12.60	15.60	18.55
Harrison,N.J. C18	....	....	12.90	16.10	19.30
Indianapolis S41	9.10	10.55	12.60	15.60	18.55
LosAngeles C1	11.15	12.60	14.80	17.80	....
LosAngeles S41	11.15	12.60	14.80	....	....
NewBritain,Conn. S15	9.40	10.70	12.90	15.90	18.85
NewCastle,Pa. B4, E5	8.95	10.40	12.60	15.60	....
NewHaven Conn. D2	9.40	10.70	12.90	15.90	....
NewKensington,Pa. A6	9.85	10.40	12.60	15.60	....
NewYork W3	...	10.70	12.90	16.10	19.30
Pawtucket,R.I. N8	9.50	10.70	12.90	15.90	18.85
Riverdale,Ill. A1	9.05	10.40	12.60	15.60	18.55
Rome,N.Y.(32) R6	8.95	10.40	12.60	15.60	18.55
Sharon,Pa. S3	8.95	10.40	12.60	15.60	18.55
Trenton,N.J. R5	...	10.70	12.90	15.90	18.85
Wallingford,Conn. W2	9.40	10.70	12.90	15.90	18.75
Warren,O. T5	8.95	10.40	12.60	15.60	18.55
Worcester Mass. A7, T6..	9.50	10.70	12.90	15.90	18.85
Youngstown S41	8.95	10.40	12.60	15.60	18.55

Spring Steel (Tempered)			Up to 0.80C	0.81-1.05C	1.06-1.35C
Bristol,Conn. W1	...	...	18.85	22.95	27.80
Buffalo W12	...	...	18.85	....	....
Fostoria,O. S1	...	...	19.05	22.15	....
FranklinPark,Ill. T6	...	...	19.20	23 30	28.15
Harrison,N.J. C18	...	...	18.85	22.95	27.80
NewYork W3	...	...	18.85	22.95	27.80
Palmer.Mass. W12	...	...	18.85	....	....
Trenton,N.J. R5	...	...	18.85	22.95	27.80
Worcester,Mass. A7, T6..	...	...	18.85	22.95	27.80
Youngstown S41	...	...	19.20	23.30	28.15

Weirton,W.Va. W6 ....10.80
Youngstown Y1 .....10.80

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2 .....8.175

STRIP, C. R. Electrogalvanized

Cleveland A7 .....7.425*
Dover O. G6 .....7.425*
Evanston,Ill. M22 ....7.525*
McKeesport,Pa. E10 ...7.50*
Riverdale,Ill. A1 .....7.525*
Warren,O. B9, S3, T5.7.425*
Worcester,Mass. A7 ...7.975
Youngstown S41 .....7.425*

*Plus galvanizing extras.

STRIP, Galvanized (Continuous)

Farrell,Pa. S3 .....7.50
Sharon,Pa. S3 .....7.50

TIGHT COOPERAGE HOOP

Atlanta A11 .....5.65
Farrell,Pa. S3 .....5.525
Riverdale,Ill. A1 .....5.675
Sharon Pa. S3 .....5.525
Youngstown U5 .....5.525

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$9.10	$9.35	$9.75
Fairfield,Ala. T2	9.20	9.45	9.85
Fairless,Pa. U5	9.20	9.45	9.85
Fontana,Calif. K1	9.75	10.00	10.40
Gary,Ind. U5	9.10	9.35	9.75
GraniteCity,Ill. G4	9.20	9.45	9.60
IndianaHarbor,Ind. I-2, Y1	9.10	9.35	9.75
Irvin,Pa. U5	9.10	9.35	9.75
Niles,O. R2	9.10	9.35	9.75
Pittsburg,Calif. C11	9.75	10.00	10.40
SparrowsPoint,Md. B2	9.10	9.35	9.75
Weirton,W.Va. W6	9.10	9.35	9 75
Yorkville,O. W10	9.10	9.35	9.75

ELECTROLYTIC TIN-COATED SHEET (Dollars per lb)			
IndianaHarbor.Ind. Y1 (20-27 Ga.)	7.90	....	....
Niles,O. R2 (20-27 Ga.)	7.90	8.10	8.30
Aliquippa,Pa. J5 (21-27 Ga.)	7.90	8.10	....

TIN PLATE, American	1.25 lb	1.50 lb
Aliquippa,Pa.J5	$10 40	$10 65
Fairfield,Ala. T2	10 50	10 75
Fairless,Pa. U5	10.50	10.75
Fontana,Calif.K1	11.05	11.30
Gary Ind. U5	10.40	10.65
Ind.Harb. Y1	10.40	10.65
Pitts.,Calif. C11	11.05	11.30
Sp Pt.,Md. B2	10.40	10.65
Weirton,W.Va.W6	10.40	10 65
Yorkville,O. W10	10.40	10.65

BLACK PLATE (Base Box)

Aliquippa,Pa. J5 .....$8.20
Fairfield,Ala. T2 .....8.30
Fairless,Pa. U5 .....8.30
Fontana,Calif. K1 .....8.85
Gary,Ind. U5 .....8.20
GraniteCity Ill. G4 .....8.30
Ind.Harbor,Ind. I-2, Y1.8.20
Irvin,Pa. U5 .....8.20
Niles,O. R2 .....8.20
Pittsburg Calif. C11 ....8.85
SparrowsPoint,Md. B2 ..8.20
Weirton,W.Va. W6 .....8.20
Yorkville,O. W10 .....8.20

HOLLOWARE ENAMELING Black Plate (29 Gage)

Aliquippa,Pa. J5 .....7.85
Gary Ind. U5 .....7 85
GraniteCity,Ill. G4 .....7.95
Ind Harbor,Ind. Y1 ....7 85
Irvin,Pa. U5 .....7.85
Yorkville,O. W10 .....7.85

MANUFACTURING TERNES (Special Coated, Base Box)

Gary,Ind. U5 .....$10.05
Irvin,Pa. U5 .....10.05

SILICON STEEL

C.R. COILS & CUT LENGTHS (22 Ga.)

Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	....	11.70	12.40	13.35	14.65
Brackenridge,Pa. A4	....	....	12.40	13.55	14.65
GraniteCity,Ill. G4	....	9.975*11.30*	12.00*	13.15*	....
IndianaHarbor Ind. I-2	....	9.875*11.20*	11.90*	13.05*	....
Mansfield,O. E6	....	9.875*11.70	12.40	13.55	14.65
Newport,Ky. A2	....	9.875 11.70*	12.40*	13.55*	14.65*
Niles,O. M21	....	9.875*11.70	12.40	13.55	....
Vandergrift,Pa. U5	....	9.875*11.70	12.40	13.55	14.65
Warren O. R2	....	9.875*11.70	12.40	13.55	14.65
Zanesville,O. A10	....	.... 11.70†	12.40	13.55	14.65
					Stator
Vandergrift,Pa. U5					8.10
Mansfield,O. E6					8.10
Warren.O. R2 (Silicon Lowcore)					8.10

SHEETS (22 Ga., coils & cut lengths) Fully Processed (Semiprocessed ½c lower)	T-72	T-65	T-58	T-52
BeechBottom.W.Va. W10	15.70	16.30	16.80	17.85
Vandergrift,Pa. U5	15.70	16.30	16.80	17.85
Zanesville,O. A10	15.70	16.30	16.80	17.85

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented: T-100	T-90	T-80	T-73	T-66	T-72
Brackenridge,Pa. A4	....	18.10	19.70	20.20	20.70	15.70††
Butler,Pa. A10	....	....	....	19.70	20.20	20.70 ....
Vandergrift,Pa. U5	..	17.10	18.10	19.70	20.20	20.70 15.70
Warren.O. R2	....	....	....	....	....	.... 15.70‡

*Semiprocessed. †Fully processed only. ‡Coils, annealed; semiprocessed ½c lower. ††Coils only.

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2 ..8.00
Aliquippa Pa. J5 .....8.00
Alton.Ill. L1 .....8.20
Atlanta A1 .....8.00
Bartonville,Ill. K4 .....8.10
Buffalo W12 .....8.00
Chicago W13 .....8.00
Cleveland A7, C20 .....8.00
Crawfordsville,Ind. M8..8.10
Donora Pa. A7 .....8.00
Duluth A7 .....8.00
Fairfield,Ala. T2 .....8.00
Fostoria,O.(24) S1 .....8.10
Houston S5 .....8.25
Jacksonville,Fla. M8 ...8.35
Johnstown,Pa. B2 .....8.00
Joliet Ill. A7 .....8 00
KansasCity,Mo. S5 .....8.25
Kokomo,Ind. C16 .....8.10
LosAngeles B3 .....8.95
Minnequa,Colo. C10 ....8.25
Monessen,Pa. P7, P16..8.00
N.Tonawanda,N Y. B11 .8.00
Palmer,Mass. W12 ....8.30
Pittsburg,Calif. C11 ...8.95
Portsmouth,O. P12 .....8.00
Rankin Pa. A7 .....8.00
S.Chicago,Ill. R2 .....8.00
S.SanFrancisco C10 ...8.95
SparrowsPoint,Md. B2 ..8.10
Sterling,Ill.(1) N15 ....8.00
Sterling,Ill. N15 .....8.10
Struthers O. Y1 .....8.00
Waukegan,Ill. A7 .....8.00
Worcester,Mass. A7 ....8.30

WIRE, Cold Heading Carbon

Elyria,O. W8 .....8.00

WIRE, Gal'd., for ACSR

Bartonville,Ill. K4 .....12.65
Buffalo W12 .....13.40
Cleveland A7 .....12.65
Donora.Pa. A7 .....12.65
Duluth A7 .....12.65
Johnstown,Pa. B2 .....13.40
KansasCity,Mo. U3 ...12 90
Minnequa,Colo. C10 ..12.775
Monessen,Pa. P7, P16..12.65
Muncie,Ind. I-7 .....13.60
NewHaven,Conn. A7 ...12.95
Palmer Mass. W12 ....13.70
Pittsburg,Calif. C11 ...13.45
Portsmouth,O. P12 ....12.65
Roebling N.J. R5 .....12 95
SparrowsPt.,Md. B2 ..13.50
Struthers O. Y1 .....13.40
Trenton.N.J. A7 .....12.95
Waukegan,Ill. A7 .....12.65
Worcester,Mass. A7 ...12.95

WIRE, Upholstery Spring

Aliquippa.Pa. J5 .....9.75
Alton.Ill. L1 .....9.95
Buffalo W12 .....9.75
Cleveland A7 .....9.75
Donora.Pa. A7 .....9.75
Duluth A7 .....9.75
Johnstown.Pa. B2 .....9.75
KansasCity,Mo. S5, U3.10.00
LosAngeles B3 .....10.70
Minnequa.Colo. C10 ....9.95
Monessen.Pa. P7, P16 ..9.75
New Haven.Conn. A7 ..10.05
Palmer.Mass. W12 ....10.05
Pittsburg Calif. C11 ...10.70
Portsmouth.O. P12 ....9 75
Roebling.N.J. R5 .....10.05
S.Chicago.Ill. R2 .....9.75
S.SanFrancisco C10 ...10.70
SparrowsPt.,Md. B2 ....9.85
Struthers O. Y1 .....9.75
Trenton N J. A7 .....10.05
Waukegan,Ill. A7 .....9.75
Worcester.Mass. A7 ...10.05

WIRE, MB Spring, High-Carbon

Aliquippa.Pa. J5 .....9.75
Alton.Ill. L1 .....9.95
Bartonville.Ill. K4 .....9.85
Buffalo W12 .....9.75
Cleveland A7 .....9 75
Donora.Pa. A7 .....9.75
Duluth A7 .....9.75
Fostoria.O. S1 .....9.80
Johnstown.Pa. B2 .....9.75
KansasCity.Mo. S5, U3.10.00
LosAngeles B3 .....10.70
Milbury.Mass.(12) N6..10.05
Minnequa.Colo. C10 ....9.95
Monessen.Pa. P7 P16 ..9.75
Muncie Ind. I-7 .....9.95
Palmer.Mass. W12 .....10.05
Pittsburg Calif. C11 ...10 70
Portsmouth.O. P12 .....9.75
Roebling N.J. R5 .....10.05
S Chicago Ill. R2 .....9.75
S.SanFrancisco C10 ...10.70
SparrowsPt.,Md. B2 ....9.85
Struthers.O. Y1 .....9.75
Trenton N J. A7 .....10.05
Waukegan Ill. A7 .....9.75
Wor'ster,Mass.A7,J4,T6 10.05

WIRE, Fine & Weaving(8" Coils)

Alton,Ill. L1 .....16.50
Bartonville Ill. K4 .....16.40
Chicago W13 .....16.30
Cleveland A7 .....16.30
Crawfordsville,Ind. M8.16.40
Fostoria,O. S1 .....16.30
Houston S5 .....16 55
Jacksonville.Fla. M8 ...16.65
Johnstown Pa. B2 .....16.30
KansasCity Mo. S5 .....16.55
Kokomo Ind. C16 .....16.30
Minnequa.Colo. C10 ...16 55
Monessen.Pa. P16 .....16.30
Muncie.Ind. I-7 .....16 50
Palmer Mass. W12 .....16.60
S.SanFrancisco C10 ...17.15
Waukegan Ill. A7 .....16.30
Worcester,Mass. A7, J6.16.60

WIRE, Tire Bead

Bartonville Ill. K4 .....17.15
Monessen.Pa. P16 .....17.15
Roebling.N.J. R5 .....17.65

ROPE WIRE (A)

Bartonville,Ill. K4 .....13.45
Buffalo W12 .....13.45
Fostoria,O. S1 .....13.45
KansasCity,Mo. U3 ...13.70
Johnstown,Pa. B2 .....13.45
Monessen.Pa. P7 .....13.45
Muncie,Ind. I-7 .....13.65
Palmer,Mass. W12 .....13.75
Portsmouth O. P12 .....13.45
Roebling,N J. R5 .....13.75
St.Louis L8 .....13.45
SparrowsPt.,Md. B2 ...13.55
Struthers.O. Y1 .....13.45
Worcester,Mass. J4 ...13.75
(A) Plow and Mild Plow; add 0.25c for Improved Plow.

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	12.35
Baltimore T6	12.65
Boston T6	12.65
Buffalo W12	12.35
Chicago W13	12.45
Cleveland A7	12.35
Crawfordsville,Ind. M8	12.35
Dover,O. G6	12.35
Farrell,Pa. S3	12.35
Fostoria,O. S1	12.35
FranklinPark,Ill. T6	12.45
Kokomo,Ind. C16	12.35
Massillon,O. R8	12.35
Milwaukee C23	12.55
Monessen,Pa. P7, P16	12.35
Palmer,Mass. W12	12.65
Pawtucket,R.I. N8	11.95
Philadelphia P24	12.65
Riverdale,Ill. A1	12.45
Rome,N.Y. R6	12.35
Sharon,Pa. S3	12.35
Trenton,N.J. R5	12.65
Warren,O. B9	12.35
Worcester,Mass. A7,T6	12.65

NAILS, Stock

	Col.
AlabamaCity,Ala. R2	173
Aliquippa,Pa. J5	173
Atlanta A11	173
Bartonville,Ill. K4	175
Chicago W13	173
Cleveland A9	173
Crawfordsville,Ind. M8	175
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	173
Houston S5	178
Jacksonville,Fla. M8	175
Johnstown,Pa. B2	173
Joliet,Ill A7	173
KansasCity, Mo. S5	178
Kokomo,Ind. C16	175
Minnequa,Colo. C10	178
Monessen,Pa. P7	173
Pittsburg,Calif. C11	192
Rankin,Pa. A7	173
S.Chicago,Ill. R2	173
SparrowsPt. Md. B2	175
Sterling,Ill. (7) N15	175
Worcester,Mass. A7	179

(To Wholesalers; per cwt)

Galveston,Tex. D7	$10.30

NAILS, Cut (100 lb keg) To Distributors (33)

Wheeling,W.Va. W10	$10.10

POLISHED STAPLES

	Col.
AlabamaCity,Ala. R2	175
Aliquippa,Pa. J5	173
Atlanta A11	177
Bartonville,Ill. K4	175
Crawfordsville,Ind. M8	177
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	173
Houston S5	180
Jacksonville,Fla. M8	177
Johnstown,Pa. B2	175
Joliet,Ill. A7	173
KansasCity,Mo. S5	180
Kokomo,Ind. C16	177
Minnequa,Colo. C10	180
Pittsburg,Calif. C11	194
Rankin,Pa. A7	173
S.Chicago,Ill. R2	175
Sparrows Pt.,Md. B2	177
Sterling,Ill. (7) N15	175
Worcester,Mass. A7	181

TIE WIRE, Automatic Baler (14½ Ga.)per 97 lb Net Box)

Coil No. 3150

AlabamaCity,Ala. R2	$9.24
Atlanta A11	10.36
Bartonville,Ill. K4	9.34
Buffalo W12	10.26
Chicago W13	9.24
Crawfordsville,Ind. M8	9.34
Donora,Pa. A7	9.24
Duluth A7	9.24
Fairfield,Ala. T2	9.24
Houston S5	10.51
Jacksonville,Fla. M8	9.34
Johnstown,Pa. B2	10.26
Joliet,Ill. A7	9.24
KansasCity,Mo. S5	10.51
Kokomo,Ind. C16	9.34
LosAngeles B3	11.05
Minnequa,Colo. C10	10.51
Pittsburg,Calif. C11	9.94
S.Chicago,Ill. R2	9.24
S.SanFrancisco C10	11.04
SparrowsPt.,Md. B2	10.36
Sterling,Ill. (37) N15	9.24

Coil No. 6500 Stand.

AlabamaCity,Ala. R2	$9.54
Atlanta A11	10.70
Bartonville,Ill. K4	9.64
Buffalo W12	10.60
Chicago W13	9.54
Crawfordsville,Ind. M8	9.64
Donora,Pa. A7	9.54
Duluth A7	9.54
Fairfield,Ala. T2	9.54
Houston S5	10.85
Jacksonville,Fla. M8	9.64
Johnstown,Pa. B2	10.60
Joliet,Ill. A7	9.54
KansasCity,Mo. S5	10.85
Kokomo,Ind. C16	9.64
LosAngeles B3	11.40
Minnequa,Colo. C10	10.85
Pittsburg,Calif. C11	10.26
S.Chicago,Ill. R2	9.54
S.SanFrancisco C10	11.40
SparrowsPt.,Md. B2	10.70
Sterling,Ill. (37) N15	9.54

Coil No. 6500 Interim

AlabamaCity,Ala. R2	$9.59
Atlanta A11	10.75
Bartonville,Ill. K4	9.69
Buffalo W12	10.65
Chicago W13	9.59
Crawfordsville,Ind. M8	9.69
Donora,Pa. A7	9.59
Duluth A7	9.59
Fairfield,Ala. T2	9.59
Houston S5	10.90
Jacksonville,Fla. M8	9.69
Johnstown,Pa. B2	10.65
Joliet,Ill. A7	9.59
KansasCity,Mo. S5	10.90
Kokomo,Ind. C16	9.69
LosAngeles B3	11.45
Minnequa,Colo. C10	10.90
PittsburgCalif. C11	10.31
S.Chicago,Ill. R2	9.59
S.SanFrancisco C10	11.45
SparrowsPt. Md. B2	10.75
Sterling,Ill.(37) N15	9.59

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	212
Atlanta A11	214
Bartonville,Ill. K4	214
Crawfordsville,Ind. M8	214
Donora,Pa. A7	212
Duluth A7	212
Fairfield,Ala. T2	212
Houston S5	217
Jacksonville,Fla. M8	214
Joliet,Ill. A7	212
KansasCity,Mo. S5	217
Kokomo,Ind. C16	214
Minnequa,Colo. C10	217
Pittsburg,Calif. C11	236
S.SanFrancisco C10	236
SparrowsPt.,Md. B2	214
Sterling,Ill.(7) N15	214

FENCE POSTS

Birmingham C15	177
ChicagoHts.,Ill. C2, I-2	177
Duluth A7	177
Franklin,Pa. F5	177
Johnstown,Pa. B2	177
Marion,O. P11	177
Minnequa,Colo. C10	182
Tonawanda,N.Y. B12	177

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	.193**
Aliquippa,Pa. J5	190§
Atlanta A11	198§
Bartonville,Ill. K4	198
Crawfordsville,Ind. M8	198
Donora,Pa. A7	193†
Duluth A7	193†
Fairfield,Ala. T2	193†
Houston S5	198**
Jacksonville,Fla. M8	198
Johnstown,Pa. B2	196§
Joliet,Ill. A7	193†
KansasCity,Mo. S5	198**
Kokomo,Ind. C16	195†
Minnequa,Colo. C10	198**
Monessen,Pa. P7	196§
Pittsburg,Calif. C11	213†
Rankin,Pa. A7	193†
S.Chicago,Ill. R2	193**
S.SanFrancisco C10	213*
SparrowsPoint,Md. B2	198§
Sterling,Ill.(7) N15	198††

WOVEN FENCE, 9-15 Ga.

	Col.
Ala.City,Ala. R2	187**
Aliq'ppa,Pa.9-11½ga.J5	190§
Atlanta A11	192§
Bartonville,Ill. K4	192
Crawfordsville,Ind. M8	192
Donora,Pa. A7	187†
Duluth A7	187†
Fairfield,Ala. T2	187†
Houston S5	192**
Jacksonville,Fla. M8	192
Johnstown,Pa.(43) B2	190§
Joliet,Ill. A7	187†
KansasCity,Mo. S5	192**
Kokomo,Ind. C16	189†
Minnequa,Colo. C10	192**
Pittsburg,Calif. C11	210†
Rankin,Pa. A7	187†
S.Chicago,Ill. R2	187**
Sterling,Ill.(7) N15	192††

	An'ld Stone	Galv. Stone
WIRE (16 gage)		
Ala.City,Ala.R2	17.85	19.40**
Aliq'ppa,Pa. J5	17.85	19.65
Bartonville K4	17.95	19.80
Cleveland A7	17.85	....
Craw'dville M8	17.95	19.80†‡
Fostoria,O. S1	18.35	19.90†
Houston S5	18.10	19.65**
Jacksonville M8	17.95	19.80†‡
Johnstown B2	17.85	19.65§
Kan.City,Mo. S5	18.10	....
Kokomo C16	17.25	18.80†
Minnequa C10	18.10	19.65**
P'lm'r,Mass.W12	18.15	19.70†
Pitts.,Calif. C11	18.20	19.75†
S.SanFran. C10	18.20	19.75**
St'ling(37) N15	17.25	19.05††
SparrowsPt. B2	17.95	19.75§
Waukegan A7	17.85	19.40†
Worcester A7	18.15	....

WIRE, Merchant Quality

	An'ld Galv.	Stone
(6 to 8 gage)		
Ala.City,Ala. R2	.9.00	9.55**
Aliquippa J5	8.65	9.325§
Atlanta(48)A11	.9.10	9.775§
Bartonville(48) K4	.9.10	9.80
Buffalo W12	.9.00	9.55†
Cleveland A7	.9.00	....
Crawfordsville M8	9.10	9.80†‡
Donora,Pa. A7	.9.00	9.55†
Duluth A7	.9.00	9.55†
Fairfield T2	.9.00	9.55†
Houston(48) S5	.9.25	9.80**
Jack'ville,Fla. M8	9.10	9.80†‡
Johnstown(48) B2	9.00	9.675§
Joliet,Ill. A7	.9.00	9.55†
Kans.City(48) S5	.9.25	9.80**
Kokomo(48) S16	.9.10	9.65†
LosAngeles B3	.9.95	10.625§
Monessen(48) P7	.8.65	9.35§
Palmer,Mass. W12	.9.30	9.85†
Pitts.,Calif. C11	.9.95	10.50†
Rankin,Pa. A7	.9.00	9.55†
S.Chicago R2	.9.00	9.55**
S.SanFran. C10	.9.95	10.50**
Spar'wsPt.(48)B2	9.10	9.775§
St'ling(1)(48)N15	9.00	9.70§§
Struthers,O. Y1	.9.00	9.65†
Worcester,Mass.A7	9.30	9.85†

Based on zinc price of: *13.50. †5c. §10c. ††10.50c. ‡‡11.00c. **Subject to zinc equalization extras. §§11.50c.

FASTENERS

(Base discounts, shipments of one to four containers, per cent off list, f.o.b. mill)

BOLTS

Machine Bolts

Full Size Body (cut thread)

½ in. and smaller:	
3 in. and shorter	55.0
3¼ in. thru 6 in.	50.0
Longer than 6 in.	37.0
⅝ in., 3 in. & shorter	47.0
3¼ in. thru 6 in.	40.0
Longer than 6 in.	31.0
¾ in. thru 1 in.:	
6 in. and shorter	37.0
Longer than 6 in.	31.0
1⅛ in. and larger:	
All lengths	31.0

Undersize Body (rolled thread)

½ in. and smaller:	
3 in. and shorter	55.0
3¼ in. thru 6 in.	50.0

Carriage Bolts

Full Size Body (cut thread)& Undersize Body (rolled thread)

½ in. and smaller:	
6 in. and shorter	48.0
Larger diameters and longer length	35.0

Lag, Plow, Tap, Blank Step, Elevator, Tire, and Fitting Up Bolts

½ in. and smaller:	
6 in. and shorter	48.0
Larger diameters and longer lengths	35.0

High Tensile Structural Bolts (Reg. semifinished hex head bolts, heavy semifinished hex nuts. Bolts — High-carbon steel, heat treated, Spec. ASTM A-325, in bulk. Full keg quantity)

⅝ in. diam	50.0
⅞ in. diam	47.0
⅞ and 1 in. diam.	43.0
1⅛ and 1¼ in. diam	34.0

NUTS

(Keg or case quantity and over)

Square Nuts, Reg. & Heavy:

All sizes	56.0

(Full container)

Hex Nuts, Reg. & Heavy

Hot Pressed & Cold Punched:

¾ in. and smaller	62.0
⅞ in. to 1½ in., incl.	56.0
1⅝ in. and larger	51.5

Hex Nuts, Semifinished, Heavy (Incl. Slotted):

¾ in. and smaller	62.0
⅞ in. to 1½ in. incl.	56.0
1⅝ in. and larger	51.5

Hex Nuts, Finished (Incl. Slotted and Castellated):

⅞ in. and smaller	65.0
1 in. to 1½ in., incl.	57.0
1⅝ in. and larger	51.5

Semifinished Hex Nuts, Reg. (Incl. Slotted):

⅝ in. and smaller	62.0
¾ in. to ⅞ in., incl.	65.0
1 in. to 1¼ in., incl.	57.0
1⅜ in. and larger	51.5

CAP AND SETSCREWS

(Base discounts, packages, per cent off list, f.o.b. mill)

Hex Head Cap Screws, Coarse or Fine Thread, Bright:

6 in. and shorter:	
⅝ in. and smaller	35.0
¾, ⅞, and 1 in.	16.0
Longer than 6 in.:	
⅝ in. and smaller	3.0
¾, ⅞, and 1 in.	+11.0

High Carbon, Heat Treated:

6 in. and shorter:	
⅝ in. and smaller	20.0
¾, ⅞, and 1 in.	+ 5.0
Longer than 6 in.:	
⅝ in. and smaller	+19.0
¾, ⅞, and 1 in.	+39.0

Flat Head Cap Screws:

¾ in. and smaller, 6 in. and shorter	+85.0

Setscrews, Square Head, Cup Point, Coarse Thread:

Through 1 in. diam:	
6 in. and shorter	+ 5.0
Longer than 6 in.	+29.0

RIVETS

F.o.b. Cleveland and/or freight equalized with Pittsburgh, f.o.b. Chicago and/or freight equalized with Birmingham except where equalization is too great.

Structural ½ in., larger 12.85

⅞ in. and smaller by 6 in. and shorter: 15.0%.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	27.24	23.13
1¼	13	....	32.25	24.41
1½	13	30.42	35.65	26.98
1¾	13	35.94	42.12	31.89
2	13	40.28	47.21	35.74
2¼	13	45.36	53.17	40.26
2½	12	49.24	57.72	43.70
2½	12	54.23	63.57	48.13
2¾	12	58.73	68.83	52.13
3	12	62.62	73.40	55.59

RAILWAY MATERIALS

Rails	Standard No. 1	Standard No. 2	All No. 2	Tee Rails 60 lb Under
Bessemer,Pa. U5	5.75	5.65	....	6.725
Ensley,Ala. T2	5.75	5.65	....	6.725
Fairfield,Ala. T2	....	....	....	6.725
Gary,Ind. U5	5.75	5.65	....	....
Huntington,W.Va. C15	....	....	....	6.725
Johnstown,Pa. B2	....	....	....	(16)6.725
Lackawanna,N.Y. B2	5.75	5.65	....	6.725
Minnequa,Colo. C10	5.75	5.65	....	7.225
Steelton,Pa. B2	5.75	5.65	....	....
Williamsport,Pa. S19	....	....	....	6.725

TIE PLATES

Fairfield,Ala. T2	6.875
Gary,Ind. U5	6.875
Lackawanna,N.Y. B2	6.875
Minnequa,Colo. C10	6.875
Seattle B3	7.025
Steelton,Pa. B2	6.875
Torrance,Calif. C11	6.875

JOINT BARS

Bessemer,Pa. U5	7.25
Fairfield,Ala. T2	7.25
Joliet,Ill. U5	7.25
Lackawanna,N.Y. B2	7.25
Minnequa,Colo. C10	7.25
Steelton,Pa. B2	7.25

AXLES

Ind.Harbor,Ind. S13	9.125
Johnstown,Pa. B2	9.125

TRACK BOLTS, Untreated

Cleveland R2	15.35
KansasCity,Mo. S5	15.35
Lebanon,Pa. B2	15.35
Minnequa,Colo. C10	15.35
Pittsburgh S44	14.75
Seattle B3	15.85

SCREW SPIKES

Lebanon,Pa. B2	15.10

STANDARD TRACK SPIKES

Fairfield,Ala. T2	9.75
Ind.Harbor,Ind. I-2,Y1	10.10
KansasCity,Mo. S5	10.10
Lebanon,Pa. B2	10.10
Minnequa,Colo. C10	10.10
Pittsburgh J5	10.10
Seattle B3	10.60
S.Chicago,Ill. R2	10.10
Struthers,O. Y1	10.10
Youngstown R2	10.10

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1⅛ to under 1 7/16 in.: 1 7/16 to under 1 15/16 in., 6.70c; 1 15/16 to 8 in., inclusive, 7.05c.
(6) Chicago or Birm. base.
(7) Chicago base 2 cols. lower.
(8) 16 Ga. and heavier.
(9) Merchant quality; add 0.35c for special quality.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ⅜" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(21) New Haven, Conn., base.
(22) Deld. San Francisco Bay area.
(23) Special quality.
(24) Deduct 0.05c, finer than 15 Ga.
(25) Bar mill bands.
(26) Deld. in mill zone, 6.295c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c.
(31) Widths over ⅝ in.; 7.375c. for widths ⅝ in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) Chicago base, 10 points lower.
(38) 13 Ga. & lighter; 60" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. in mill zone or within switching limits, 5.635c.
(43) 9-14½ Ga.
(44) To fabricators.
(48) 6-7 Ga.
(49) 3½ in. and smaller rounds; 9.65c, over 3½ in. and other shapes.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25
Ambridge, Pa. N2	+12.25	....	+5.75	....	+3.25	....	+1.75	....	+1.75	....	+2	....	0.5	....
Lorain, O. N3	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25
Youngstown Y1	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25

ELECTRIC STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Alton, Ill. L1	....	....	....	....	....	....	0.25	+15	3.25	+11	6.75	+6.5	9.25	+5.75
Benwood, W. Va. W10	1.5	+25	+10.5	+34	+21	+42.5	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Butler, Pa. F6	4.5	+22	+8.5	+32	+19.5	+41	....	....	....	....	....	....	....	....
Etna, Pa. N2	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Fairless, Pa. N3	....	....	....	....	....	....	0.25	+15	3.25	+11	6.75	+6.5	9.25	+5.75
Fontana, Calif. K1	....	....	....	....	....	....	+10.75	+26	+7.75	+22	+4.25	+17.5	+1.75	+16.75
Indiana Harbor, Ind. Y1	....	....	....	....	....	....	1.25	+14	4.25	+10	7.75	+5.5	10.25	+6.25
Lorain, O. N3	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Sharon, Pa. S4	4.5	+22	+8.5	+32	+19.5	+41	....	....	....	....	....	....	....	....
Sharon, Pa. M6	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Sparrows Pt., Md. B2	2.5	+24	+10.5	+34	+21.5	+43	0.25	+15	3.25	+11	6.75	+6.5	9.25	+5.75
Wheatland, Pa. W9	4.5	+22	+8.5	+32	+19.5	+41	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Youngstown R2, Y1	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.72		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Alton, Ill. L1	9.75	+4.75	10.25	+4.25	11.75	+4.5	11.75	+4.5	1.25	+15.5	1.25	+15.5
Benwood, W. Va. W10	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Etna, Pa. N2	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Fairless, Pa. N3	9.75	+4.75	10.25	+4.25	11.75	+4.5	11.75	+5.5	1.25	+15.5	1.25	+15.5
Fontana, Calif. K1	+1.25	+15.75	+0.75	+15.25	0.75	+15.5	0.75	+15.5	+9.75	+26.5	+9.75	+26.5
Indiana Harbor, Ind. Y1	10.75	+3.75	11.25	+3.25	12.75	+3.5	12.25	+3.5	2.25	+14.5	2.25	+14.5
Lorain, O. N3	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+3.5	....	....	....	....
Sharon, Pa. M6	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	....	....	....	....
Sparrows Pt., Md. B2	9.75	+4.75	10.25	+4.25	11.75	+4.5	11.75	+4.5	1.25	+15.5	1.25	+15.5
Wheatland, Pa. W9	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Youngstown R2, Y1	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5

*Galvanized pipe discounts based on price of zinc at 11.00c, East St. Louis.

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	—Rerolling— Ingot	Slabs	Forging Billets	H.R. Strip	H.R. Rods; C.F. Wire	Bars; Structural Shapes	Plates	Sheets	C.R. Strip; Flat Wire
201	22.75	25.00	....	36.00	....	43.50	39.25	48.50	45.00
202	24.75	28.25	37.75	39.00	42.25	44.50	40.00	49.25	49.25
301	24.00	26.00	38.75	37.25	43.50	46.00	41.25	51.25	47.50
302	26.25	29.50	39.50	40.50	44.25	46.75	42.25	52.00	52.00
302B	26.50	30.75	42.25	45.75	46.75	49.00	44.50	57.00	57.00
303	....	33.25	42.50	....	47.25	49.75	45.00	56.75	56.75
304	25.00	31.25	42.00	43.75	47.00	49.50	45.75	55.00	55.00
304L	....	....	49.75	51.50	54.75	57.25	53.50	62.75	62.75
305	29.50	34.75	44.00	47.50	47.00	49.50	46.25	58.75	58.75
308	32.00	36.25	49.00	50.25	54.75	57.75	55.25	63.00	63.00
309	41.25	47.50	60.00	64.50	66.25	69.50	66.00	80.50	80.50
310	51.50	59.50	81.00	84.25	89.75	94.50	87.75	96.75	96.75
314	....	....	80.50	....	89.75	94.50	87.75	....	104.25
316	41.25	47.50	64.50	68.50	71.75	75.75	71.75	80.75	80.75
316L	....	....	72.25	76.25	79.50	83.50	79.50	88.50	88.50
317	49.75	58.00	79.75	88.25	89.50	94.25	88.50	101.00	101.00
321	33.50	38.00	48.75	53.50	54.50	57.50	54.75	65.50	65.50
330	....	....	123.25	....	113.00	143.75	135.00	149.25	149.25
18-8 CbTa	38.50	48.25	57.75	63.50	63.75	67.25	64.75	79.25	79.25
403	....	....	29.25	....	33.25	35.00	30.00	40.25	40.25
405	20.25	26.50	30.75	36.00	34.75	36.50	32.50	46.75	46.75
410	17.50	19.50	29.25	31.00	33.25	35.00	30.00	40.25	40.25
416	....	....	29.75	....	33.75	35.50	31.25	48.25	48.25
420	....	31.50	35.50	41.75	40.75	42.75	40.25	62.00	62.00
430	17.75	19.75	29.75	32.00	33.75	35.50	31.00	40.75	40.75
430F	....	....	30.50	....	34.25	36.00	31.75	51.75	51.75
431	....	29.75	39.25	....	43.50	46.00	41.00	56.00	56.00
446	....	....	40.75	59.00	46.00	48.25	42.75	70.00	70.00

Producers Are: Allegheny Ludlum Steel Corp.; American Steel & Wire Div., U. S. Steel Corp.; Anchor Drawn Steel Co., division of Vanadium-Alloys Steel Co.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; A. M. Byers Co.; Calstrip Steel Corp.; G. O. Carlson Inc.; Carpenter Steel Co.; Carpenter Steel Co. of New England; Charter Wire Products; Crucible Steel Co. of America; Damascus Tube Co.; Dearborn Div., Sharon Steel Corp.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Firth Sterling Inc.; Fort Wayne Metals Inc.; Green River Steel Corp., subsidiary of Jessop Steel Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Ellwood Ivins Steel Tube Works Inc.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Stainless & Strip Div., Jones & Laughlin Steel Corp.; Joslyn Stainless Steels, division of Joslyn Mfg. & Supply Co.; Latrobe Steel Co.; Lukens Steel Co.; Maryland Fine & Specialty Wire Co. Inc.; McLouth Steel Corp.; Metal Forming Corp.; Midvale-Heppenstall Co.; National Standard Co.; National Tube Div., U. S. Steel Corp.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Riverside-Alloy Metal Div., H. K. Porter Company, Inc.; Rodney Metals Inc.; Sawhill Tubular Products Inc.; Sharon Steel Corp.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Standard Tube Co.; Superior Steel Div., Copperweld Steel Co.; Superior Tube Co.; Swepco Tube Corp.; Techalloy Co. Inc.; Timken Roller Bearing Co.; Trent Tube Co., subsidiary of Crucible Steel Co. of America; Tube Methods Inc.; Ulbrich Stainless Steel Inc.; Union Steel Corp.; U. S. Steel Corp.; Universal Cyclops Steel Corp.; Vanadium-Alloys Steel Co.; Wall Tube & Metal Products Co.; Wallingford Steel, subsidiary, Allegheny Ludlum Steel Corp.; Washington Steel Corp.; Seymour Mfg. Co.

Clad Steel

	Plates— Carbon Base 5%	10%	15%	20%	Sheets Carbon Base 20%
Stainless					
302	....	....	....	....	37.50
304	26.05	28.80	31.55	34.30	39.75
304L	30.50	33.75	36.95	40.15	....
316	38.20	42.20	46.25	50.25	58.25
316L	42.30	46.75	51.20	55.65	....
316 Cb	49.90	55.15	60.40	65.65	....
321	31.20	34.50	37.75	41.05	47.25
347	36.90	40.80	44.65	48.55	57.00
405	22.25	24.60	26.90	29.25	....
410	20.55	22.70	24.85	27.00	....
430	21.20	23.45	25.65	27.90	....
Inconel	48.90	59.55	70.15	80.85	....
Nickel	41.65	51.95	63.30	72.70	....
Nickel, Low Carbon	41.95	52.60	63.30	74.15	....
Monel	43.35	53.55	63.80	74.05	....

	Strip, Carbon Base —Cold Rolled— 10%	Both Sides
Copper*	$36.20	$43.15

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4, and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Reg. Carbon (W-1)	0.330	W-Cr Hot Work (H-12)	0.530
Spec. Carbon (W-1)	0.385	W Hot Wk. (H-21)	1.425-1.44
Oil Hardening (O-1)	0.505	V-Cr Hot Work (H-13)	0.550
V-Cr Hot Work (H-11)	0.505	Hi-Carbon-Cr (D-11)	0.955

Grade by Analysis (%) W	Cr	V	Co	Mo	AISI Designation	$ per lb
18	4	1	....	...	T-1	1.840
18	4	2	....	...	T-2	2.005
13.5	4	3	....	...	T-3	2.105
18.25	4.25	1	4.75	...	T-4	2.545
18	4	2	9	...	T-5	2.915
20.25	4.25	1.6	12.95	...	T-6	4.330
13.75	3.75	2	5	...	T-8	2.485
1.5	4	1	....	8.5	M-1	1.200
6.4	4.5	1.9	....	5	M-2	1.345
6	4	3	....	6	M-3	1.590

Tool steel producers include: A4, A8, B2, B8, C4, C9, C12, C18, F2, J3, L3, M14, S8, U4, V2, and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate.

	Basic	No. 2 Foundry	Malle-able	Besse-mer
Birmingham District				
Birmingham R2	62.00	62.50**	....	....
Birmingham U6	....	62.50**	66.50	....
Woodward,Ala. W15	62.00*	62.50**	66.50	....
Cincinnati, deld.	....	70.20	....	....
Buffalo District				
Buffalo H1, R2	66.00	66.50	67.00	67.50
N.Tonawanda,N.Y. T9	....	66.50	67.00	67.50
Tonawanda,N.Y. W12	66.00	66.50	67.00	67.50
Boston, deld.	77.29	77.79	78.29	....
Rochester,N.Y., deld.	69.02	69.52	70.02	....
Syracuse,N.Y., deld.	70.12	70.62	71.12	....
Chicago District				
Chicago I-3	66.00	66.50	66.50	67.00
S.Chicago,Ill. R2	66.00	66.50	66.50	67.00
S.Chicago Ill. W14	66.00	....	66.50	67.00
Milwaukee, deld.	69.02	69.52	69.52	70.02
Muskegon,Mich., deld.	....	74.52	74.52	....
Cleveland District				
Cleveland R2, A7	66.00	66.50	66.50	67.00
Akron,Ohio, deld.	69.52	70.02	70.02	70.52
Mid-Atlantic District				
Birdsboro,Pa. B10	68.00	68.50	69.00	69.50
Chester,Pa. P4	68.00	68.50	69.00	....
Swedeland,Pa. A3	68.00	68.50	69.00	69.50
NewYork, deld.	....	75.50	76.00	....
Newark,N.J., deld.	72.69	73.19	73.69	74.19
Philadelphia, deld.	70.41	70.91	71.41	71.99
Troy,N.Y. R2	68.00	68.50	69.00	69.50
Pittsburgh District				
Nevilleisland,Pa. P6	66.00	66.50	66.50	67.00
Pittsburgh (N&S sides), Aliquippa, deld.	....	67.95	67.95	68.48
McKeesRocks,Pa. deld.	....	67.60	67.60	68.13
Lawrenceville,Homestead, Wilmerding Monaca,Pa., deld.	....	68.26	68.26	68.79
Verona,Trafford,Pa., deld.	68.29	68.82	68.82	69.35
Brackenridge,Pa., deld.	68.60	69.10	69.10	69.63
Midland,Pa. C18	66.00	....	....	....
Youngstown District				
Hubbard,Ohio Y1	....	....	66.50	....
Sharpeville,Pa. S6	66.00	....	66.50	67.00
Youngstown Y1	....	....	66.50	....
Mansfield,Ohio, deld.	71.30	....	71.80	72.30

	Basic	No. 2 Foundry	Malle-able	Besse-mer
Duluth I-3	66.00	66.50	66.50	67.00
Erie,Pa. I-3	66.00	66.50	66.50	67.00
Everett,Mass. E1	67.50	68.00	68.50	....
Fontana,Calif. K1	75.00	75.50	....	....
Geneva,Utah C11	66.00	66.50	....	....
GraniteCity,Ill. G4	67.90	68.40	68.90	....
Ironton,Utah C11	66.00	66.50	....	....
Minnequa,Colo. C10	68.00	68.50	69.00	....
Rockwood,Tenn. T3	....	62.50‡	66.50	....
Toledo,Ohio I-3	66.00	66.50	66.50	67.00
Cincinnati, deld.	72.94	73.44	....	....

*Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.
**Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.50.
‡Phos. 0.50% up; Phos. 0.30-0.49%, $63.50.

PIG IRON DIFFERENTIALS

Silicon: Add 75 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos. iron on which base is 1.75-2.00%.

Manganese: Add 50 cents per ton for each 0.25% manganese over 1% or portion thereof.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.01-6.50% silicon; add 75c for each 0.50% silicon or portion thereof over the base grade within a range of 6.50 to 11.50%; starting with silicon over 11.50% add $1.50 per ton for each 0.50% silicon or portion thereof up to 14%; add $1 for each 0.50% Mn over 1%)

Jackson,Ohio I-3, J1	$78.00
Buffalo H1	79.25

ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.25 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

CalvertCity,Ky. P15	$99.00
NiagaraFalls,N.Y. P15	99.00
Keokuk,Iowa Open-hearth & Fdry, $9 freight allowed K2	103.50
Keokuk,Iowa O.H. & Fdry, 12½ lb piglets, 16% Si, max fr'gt allowed up to $9, K2	106.50

LOW PHOSPHORUS PIG IRON, Gross Ton

Lyles,Tenn. T3 (Phos. 0.035% max)	$73.00
Rockwood,Tenn. T3 (Phos. 0.035% max)	73.00
Troy,N.Y. R2 (Phos. 0.035% max)	73.00
Philadelphia, deld.	81.67
Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Duluth I-3 (Intermediate) (Phos. 0.036-0.075%)	71.00
Erie,Pa. I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Nevilleisland,Pa. P6 (Intermediate) (Phos. 0.036-0.075% max)	71.00

Steel Service Center Products

Representative prices, per pound, subject to extras, f.o.b. warehouse. City delivery charges are 15 cents per 100 lb except: Denver, Moline, Norfolk, Richmond, Washington, 20 cents; Baltimore, Boston, Los Angeles, New York, Philadelphia, Portland, Spokane, San Francisco, 10 cents; Atlanta, Birmingham, Chattanooga, Houston, Seattle, no charge.

	SHEETS				STRIP	BARS			Standard Structural Shapes	PLATES	
	Hot-Rolled	Cold-Rolled	Galv. 10 Ga.†	Stainless Type 302	Hot-Rolled*	H.R. Rounds	C.F. Rds.‡	H.R. Alloy 4140††[3]		Carbon	Floor
Atlanta	8.59§	9.86§	10.13	....	8.91	9.39	13.24#	....	9.40	9.29	11.21
Baltimore	8.55	9.25	9.99	....	9.06	9.45	11.85#	15.48	9.55	9.00	10.50
Birmingham	8.18	9.45	10.46	....	8.51	8.99	....	....	9.00	8.89	10.90
Boston	10.07	11.12	11.92	53.50	12.17	10.19	13.30#	15.64	10.64	10.27	11.95
Buffalo	8.40	9.60	10.85	55.98	8.75	9.15	11.45#	15.40	9.25	9.20	10.75
Chattanooga	8.35	9.69	9.65	....	8.40	8.77	10.46	....	8.88	8.80	10.66
Chicago	8.25	9.45	10.90	53.00	8.51	8.99	9.15	15.05	9.00	8.89	10.20
Cincinnati	8.43	9.51	10.95	53.43	8.83	9.31	11.53#	15.37	9.56	9.27	10.53
Cleveland	8.36	9.54	11.00	52.33	8.63	9.10	11.25#	15.16	9.39	9.13	10.44
Dallas	8.80	9.30	....	....	8.85	8.80	....	....	8.75	9.15	10.40
Denver	9.40	11.84	12.94	....	9.43	9.80	11.19	....	9.84	9.76	11.08
Detroit	8.51	9.71	11.25	56.50	8.88	9.30	9.51	15.33	9.56	9.26	10.46
Erie, Pa.	8.35	9.45	9.95[10]	....	8.60	9.10	11.25	....	9.35	9.10	10.60
Houston	8.40	8.90	10.29	52.00	8.45	8.40	11.60	15.75	8.35	8.75	10.10
Jackson, Miss.	8.52	9.79	....	....	8.84	9.82	10.68	....	9.33	9.22	11.03
Los Angeles	8.70[2]	10.80[2]	12.20	57.60	9.15	9.10[2]	12.95[2]	16.35	9.00[2]	9.10[2]	11.30[2]
Memphis, Tenn.	8.59	9.80	....	....	8.84	9.32	11.25#	....	9.33	9.22	10.86
Milwaukee	8.39	9.59	11.04	....	8.65	9.13	9.39	15.19	9.22	9.03	10.34
Moline, Ill.	8.55	9.80	....	....	8.84	8.95	9.15	....	8.99	8.91	....
New York	9.17	10.49	11.30	53.08	9.64	9.99	13.25#	15.50	9.74	9.77	11.05
Norfolk, Va.	8.65	....	....	....	9.15	9.30	12.75	....	9.65	9.10	10.50
Philadelphia	8.20	9.25	10.61	52.71	9.25	9.40	11.95#	15.48	9.10	9.15	10.40**
Pittsburgh	8.35	9.55	10.90	52.00	8.61	8.99	11.25#	15.05	9.00	8.89	10.20
Richmond, Va.	8.65	....	10.79	....	9.15	9.55	....	....	9.65	9.10	10.60
St. Louis	8.63	9.83	11.28	....	8.89	9.37	9.78	15.43	9.48	9.27	10.58
St. Paul	8.79	10.04	11.49	....	8.84	9.21	9.86	....	9.38	9.30	10.49
San Francisco	9.65	11.10	11.40	55.10	9.75	10.15	13.60	16.25	9.85	10.00	12.35
Seattle	10.30	11.55	12.50	56.52	10.25	10.50	14.70	16.80[3]	10.20	10.10	12.50
South'ton, Conn.	9.07	10.33	10.71	....	9.48	9.74	....	....	9.57	9.57	10.91
Spokane	10.30	11.55	12.50	57.38	10.75	11.00	14.70	16.80	10.20	10.10	13.00
Washington	9.15	....	....	....	9.65	10.05	12.50	....	10.15	9.60	11.10

*Prices do not include gage extras; †prices include gage and coating extras; ‡includes 35-cent bar quality extras; §42 in. and under; **¼ in. and heavier; ††as annealed; ‡‡⅝ in. to 4 in. wide inclusive; #net price, 1 in. round C-1018.

Base quantities, 2000 to 4999 lb except as noted; cold-finished bars, 2000 lb and over except in Seattle, 2000 to 3999 lb; stainless sheets, 8000 lb except in Chicago, New York, Boston, Seattle, 10,000 lb and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb, except in Seattle, 30,000 lb and over; [2]—30,000 lb; [3]—1000 to 4999 lb; [8]—1000 to 1999 lb; [10]—2000 lb and over.

Refractories

Fire Clay Brick (per 1000 pieces*)

High-Heat Duty: Ashland, Grahn, Hayward, Hitchens, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Winburne, Snow Shoe, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parrall, Portsmouth, Ohio, Ottawa, Ill. Stevens Pottery, Ga., Canon City, Colo., $140; Salina, Pa., $145; Niles, Ohio, $138; Cutler, Utah, $175.

Super-Duty: Ironton, Ohio, Vandalia, Mo., Olive Hill, Ky., Clearfield, Salina, Winburne, Snow Shoe, Pa., New Savage, Md., St. Louis, $185; Stevens Pottery, Ga., $195; Cutler, Utah, $248.

Silica Brick (per 1000 pieces*)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Pt.. Matilda, Pa., Portsmouth, Ohio. Hawstone, Pa., St. Louis, $158; Warren, Niles, Windham, Ohio, Hays, Latrobe, Morrisville, Pa., $163; E. Chicago, Ind., Joliet, Rockdale, Ill., $168; Canon City, Colo., $173; Lehi, Utah, $183; Los Angeles, $185.

Super-Duty: Sproul, Hawstone, Pa., Niles, Warren, Windham, Ohio, Leslie, Md., Athens, Tex., $158; Morrisville, Hays, Latrobe, Pa., $163; E. Chicago, Ind., St. Louis, $168; Canon City, Colo., $183; Curtner, Calif. $185.

Semisilica Brick (per 1000 pieces*)

Woodbridge, N. J., Canon City, Colo., $140; Philadelphia, Clearfield, Pa., $145.

Ladle Brick (per 1000 pieces*)

Dry Pressed: Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Vanport, Pa., Mexico, Vandalia, Mo., Wellsville, Irondale, New Salisbury, Ohio, $96.75; Clearfield, Pa., Portsmouth, Ohio, $102.

High-Alumina Brick (per 1000 pieces*)

50 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., Danville, Ill., $253; Philadelphia, $265; Clearfield, Pa., $230; Orviston, Snow Shoe, Pa., $260.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $310; Danville, Ill., $313; Clearfield, Orviston, Snow Shoe, Pa., $320; Philadelphia, $325.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $350; Danville, Ill., $353; Clearfield, Orviston, Snow Shoe, Pa., $360; Philadelphia, $365.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., St. Louis, $188; Ottawa, Ill., $205.

Nozzles (per 1000)

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., St. Louis, $310.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., $234.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, Gibsonburg, Nario, Ohio, $16.75; Thornton, McCook, Ill., $17; Dolly Siding, Bonne Terre, Mo., $15.60.

Magnesite (per net ton)

Domestic, dead-burned, ½ in. grains with fines: Chewelah, Wash., Luning, Nev., $46; ⅜ in. grains with fines: Baltimore, $73.

*—9 in x 4½ x 2.50 sts.

Fluorspar

Metallurgical grades, f.o.b. shipping point in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $37-$41; 70%, $36-$40; 60%, $33-$36.50. Imported, net ton, f.o.b. cars point of entry, duty paid, metallurgical grade; European, $30-$33, contract; Mexican, all rail, duty paid, $25; barge, Brownsville, Tex., $27.

Metal Powder

(Per pound f.o.b. shipping point in ton lots for minus 100 mesh, except as noted)

	Cents
Sponge Iron, domestic and foreign, 98% Fe:	
Minimum truckIots, freight allowed east of Mississippi River:	
100 mesh, 100 lb bags	11.25
100 mesh, 100 lb pails	9.10‡
40 mesh, 100 lb bags	8.10††
Electrolytic Iron, Melting stock, 99.87% Fe, irregular fragments of ⅛ in. x 1.3 in.	28.75
(In contract lots of 240 tons price is 22.75c)	
Annealed, 99.5% Fe..	36.50
Unannealed (99 + % Fe)	36.00
Unannealed (99 + % Fe) (minus 325 mesh)	59.00
Powder Flake (minus 16, plus 100 mesh)..	29.00
Carbonyl Iron: 98.1-98.9%, 3 to 20 microns, depending on grade, 93.00-290.00 in standard 200-lb containers; all minus 200 mesh.	
Aluminum: Atomized, 500-lb drum, freight allowed Carlots	38.50
Ton lots	40.50
Antimony, 500-lb lots	42.00*
Brass, 5000-lb lots	34.50-51.00†
Bronze, 5000-lb lots	52.40-56.40†
Copper: Electrolytic	14.25*
Reduced	14.25*
Lead	7.50*
Manganese, Electrolytic: Minus 50 mesh	43.00
Nickel	80.60
Nickel-Silver, 5000-lb lots	53.00-57.30†
Phosphor-Copper, 5000-lb lots	64.80
Copper (atomized) 5000-lb lots	45.30
Solder	7.00*
Stainless Steel, 304	$0.89
Stainless Steel, 316	$1.07
Tin	14.00*
Zinc, 5000-lb lots	19.00-32.20‡
Tungsten: Carbon reduced, 98.8% min, minus 65 mesh	nom.**
1000 lb	2.80
Less 1000 lb	2.95
Chromium, electroytic 99.8% Cr, min metallic basis	5.00

*Plus cost of metal. †Depending on composition. ‡Depending on mesh. §Cutting and scrafing grade. **Depending on price of ore. ††Welding grade.

Electrodes

Threaded with nipple; unboxed, f.o.b. plant

GRAPHITE

—Inches— Diam	Length	Per 100 lb
2	24	$64.00
2½	30	41.50
3	40	39.25
4	40	37.00
5⅛	40	36.50
6	60	33.25
7	60	29.75
8, 9, 10	60	29.50
12	72	28.25
14	60	28.25
16	72	27.25
17	60	27.25
18	72	27.00
20	72	26.50
24	84	27.25

CARBON

8	60	14.25
10	60	13.80
12	60	14.75
14	60	14.75
14	72	12.55
17	60	12.65
17	72	12.10
20	90	11.55
24	72, 84	11.95
24	96	12.10
30	84	12.00
35, 40	110	11.60
40	100	12.50

Imported Steel

(Base per 100 lb, landed, duty paid, based on current ocean rates. Any increase in these rates is for buyer's account. Source of shipment: Western continental European countries.)

	North Atlantic	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A 305	$5.40	$5.40	$5.30	$5.75
Bar Size Angles	5.10	5.10	5.00	5.43
Structural Angles	5.10	5.10	4.90	5.43
I-Beams	5.11	5.11	5.01	5.45
Channels	5.06	5.06	4.96	5.40
Plates (basic bessemer)	6.20	6.15	6.05	6.51
Sheets, H.R.	8.30	8.30	8.30	8.60
Sheets, C.R. (drawing quality)	8.75	8.75	8.75	9.12
Furring Channels, C.R., 1000 ft, ¾ x 0.30 lb per ft	25.76	25.64	25.64	26.51
Barbed Wire (†)	6.55	6.55	6.55	6.90
Merchant Bars	...	...	5.20	5.65
Hot-Rolled Bands	7.15	7.15	7.15	7.55
Wire Rods, Thomas Commercial No. 5	5.19	5.32	5.14	5.49
Wire Rods, O.H. Cold Heading Quality No. 5	5.09	6.22	6.04	6.34
Bright Common Wire Nails (‡)	7.65	7.65	7.65	7.95

†Per 82 lb net reel. ‡Per 100-lb kegs, 20d nails and heavier.

Ores

Lake Superior Iron Ore

(Prices effective at start of the 1959 shipping season, subject to later revision, gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Mesabi bessemer	$11.60
Mesabi nonbessemer	11.45
Old Range bessemer	11.85
Old Range nonbessemer	11.70
Open-hearth lump	12.70
High phos	11.45

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect Jan. 1, 1959, and increases or decreases after that date are absorbed by the seller.

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

New Jersey, concentrates	nom.

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 65%	21.00
Brazilian iron ore, 68.5%	22.60

Tungsten Ore

Net ton, unit

Foreign wolframite, good commercial quality	$10.75-11.00*
Domestic, concentrates f.o.b. milling points	16.00-17.00†

*Before duty. †Nominal.

Manganese Ore

Mn 46-48%, Indian 91.5c-96.5c, nom. per long ton unit, c.i.f. U. S. ports, duty for buyer's account.

Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and Rhodesian

48% 3:1	$42.00-44.00†
48% 2.8:1	38.00-40.00†
48% no ratio	29.00-31.00†

South African Transvaal

44% no ratio	19.75-21.00
48% no ratio	29.00-31.00

Turkish

48% 3:1	51.00-55.00†

Domestic

Rail nearest seller

18% 3:1	39.00

Molybdenum

Sulfide concentrate, per lb of Mo content, mines, unpacked	$1.23

Antimony Ore

Per short ton unit of Sb content, c.i.f. seaboard

50-55%	$2.25-2.40
60-65%	2.50-3.10

Vanadium Ore

Cents per lb V_2O_5

Domestic	31.00

†Nominal.

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, Pa., furnace	$14.75-15.25
Connellsville, Pa., foundry	18.00-18.50

Oven Foundry Coke

Birmingham, ovens	$30.35
Cincinnati, deld.	33.34
Buffalo, ovens	32.00
Detroit, ovens	32.00
Pontiac, Mich., deld.	33.95
Saginaw, Mich., deld.	35.53
Erie, Pa., ovens	32.00
Everett, Mass., ovens: New England, deld.	33.55*
Indianapolis, ovens	31.25
Ironton, Ohio, ovens	30.50
Cincinnati, deld.	33.54
Kearney, N. J., ovens	31.25
Milwaukee, ovens	32.00
Neville Island (Pittsburgh), Pa., ovens	30.75
Painesville, Ohio, ovens	32.00
Cleveland, deld.	34.19
Philadelphia, ovens	31.00
St. Louis, ovens	33.00
St. Paul, ovens	31.25
Chicago, deld.	34.73
Swedeland, Pa., ovens	31.00
Terre Haute, Ind., ovens	31.25

*Within $5.15 freight zone from works.

Coal Chemicals

(Representative prices)

Cents per gal f.o.b. tank cars or tank trucks, plant.

Pure benzene	31.00
Xylene, industrial grade	29.00
Creosote	24.00
Naphthalene, 78 deg	5.00
Toluene, one deg (del. east of Rockies)	25.00

Cents per lb, f.o.b. tank cars or tank trucks, deld.

Phenol, 90 per cent grade	15.50

Per net ton bulk, f.o.b. cars or trucks, plant

Ammonium sulfate, regular grade	$32.00

Ferroalloys

MANGANESE ALLOYS

Spiegeleisen: Carlot, per gross ton, Palmerton, Neville Island, Pa. 21-23% Mn, $105; 19-21% Mn, 1-3% Si, $102.50; 16-19% Mn, $100.50.

Standard Ferromanganese: (Mn 74-76%, C 7% approx) base price per net ton, $245, Johnstown, Duquesne, Sheridan, Neville Island, Pa.; Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Add or subtract $2 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively (Mn 79-81%). Lump $253 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

High-Grade Low-Carbon Ferromanganese: (Mn 85-95%). Carload, lump, bulk, max 0.07% C, 35.1c per lb of contained Mn, carload packed 36.4c, ton lots 37.9c, less ton 39.1c. Delivered. Deduct 1.5c for max 0.15% C grade from above prices, 3c for max 0.03% C, 3.5c for max 0.5% C, and 6.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max. P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.25-1.5%, Si 1.5% max). Carload, lump, bulk, 25.5c per lb of contained Mn; packed, carload 26.8c, ton lot 28.4c, less ton 29.6c.

Electrolytic Manganese Metal: Min carload, bulk, 33.25c; 2000 lb to min carload, 36c; less ton, 38c; 50 lb cans, add 0.5c per lb. Premium for hydrogen-removed metal, 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or any point east of Mississippi River; or f.o.b. Marietta, O., freight allowed.

Silicomanganese: (Mn 65-68%). Carload, lump, bulk, 1.50% C grade, 18.5-21% Si, 12.8c per lb of alloy. Packed, c.l. 14c, ton 14.45c, less ton 15.45c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. For 2% C grade, Si 16-18.5%, deduct 0.2c from above prices. For 3% grade, Si 12.5-16%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lot, 2" x D, $1.50 per lb of contained Ti; less ton to 300 lb, $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lot $1.35, less ton to 300 lb $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract min c.l. $240 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi River and north of Baltimore and St. Louis. Spot, $245.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4%). Contract, c.l. $290 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed. Spot, $295.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: C.l. lump, bulk, 28.75c per lb of contained Cr. Delivered.

Charge Chrome 1: Cr 63%, C 6% max, Si 7% max, 22c. Charge Chrome 2: Cr 50-59%, C 8% max, Si 6% max, 23c. Carload, lump, bulk, per lb Cr.

Refined Chrome 1: Cr 50-59%, C 5% max, Si 2% max, 25c. Refined Chrome 2: Si 12% max, 24c. Carload, lump, bulk, per lb Cr.

Low-Carbon Ferrochrome: Cr 63-66% (Simplex), carload, lump, bulk, C 0.025% max, 36.75c per lb contained Cr; 0.010% max, 37.75c. Delivered.

Cr 67-71%, carload, lump, bulk, 0.025% max, 39.75c; 0.05% max, 39.00c; 0.10% max, 38.50c; 0.20% max, 38.25c; 0.50% max, 38.00c; 1.0% max, 37.75c; 1.5% max, 37.50; 2.0% max, 37.25c. Delivered.

Foundry Ferrochrome, High-Carbon: (Cr 62-66%, C 5-7%, Si 7-10%). C.l., 2" x D, bulk 30.8c per lb of contained Cr. Packed, c.l. 32.4c, ton 34.2c, less ton 35.7c. Delivered. Spot, add 0.25c.

Foundry Ferrosilicon Chrome: (Cr 50-54%, Si 28-32%, C 1.25% max). SM x D, carload bulk 20.05c per lb of alloy, carload packed, 21.25c, ton lot 22.50c; less ton lot 23.70c. Delivered. Spot, add 0.25c.

Ferrochrome-Silicon: Cr 39-41%, Si 42-45%, C 0.05% max or Cr 33-36%, Si 45-48%, C 0.05% max. Carload, lump, bulk, 3" x down and 2" x down, 28.25c per lb contained Cr, 14.60c per lb contained Si. 0.75" x down 29.40c per lb contained Cr, 14.60c per lb contained Si.

Chromium Metal, Electrolytic: Commercial grade (Cr 99.8% min, metallic basis, Fe 0.2% max). Contract, carlot, packed, 2" x D plate (about ⅛" thick) $1.15 per lb, ton lot $1.17, less ton lot $1.19. Delivered. Spot, add 5c.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth grade (V 50-55%, Si 8% max, C 3% max). Contract, any quantity, $3.20 per lb of contained V. Delivered. Spot, add 10c. **Special Grade:** (V 50-55% or 70-75%, Si 2% max, C 0.5% max) $3.30. **High Speed Grade:** (V 50-55% or 70-75%, Si 1.50% max, C 0.20% max) $3.40.

Grainal: Vanadium Grainal No. 1 $1.05 per lb; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lot, packed, $1.38 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

50% Ferrosilicon: Carload, lump, bulk, 14.6c per lb contained Si. Packed, c.l. 17.1c, ton lot 18.55c, less ton 20.20c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.45c to 50% ferrosilicon prices. **65% Ferrosilicon:** Carload, lump, bulk, 15.75c per lb contained silicon. Packed, c.l. 17.75c, ton lot 19.55c, less ton 20.9c. Delivered. Spot, add 0.35c.

75% Ferrosilicon: Carload, lump, bulk, 16.9c per lb of contained Si. Packed, c.l. 18.8c, ton lot 20.45c, less ton 21.7c. Delivered. Spot, add 0.3c.

90% Ferrosilicon: Carload, lump, bulk, 20c per lb of contained Si. Packed, c.l. 21.65c, ton lot 23.05c, less ton 24.1c. Delivered. Spot, add 0.25c.

Silicon Metal: (98% min Si, 1.00% max Fe, 0.07% max Ca). C.l. lump, bulk, 21.5c per lb of Si. Packed, c.l. 23.15c, ton lot 24.45c, less ton 25.45c. Add 0.5c for max 0.03% Ca grade. Add 0.5c for 0.50% Fe grade analyzing 98.25% min Si.

Alsifer: (Approx 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.85c per lb of alloy; ton lot, packed, 10.85c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 39-43%, C 0.20% max). Contract, c.l. lump, bulk, 9.25c per lb of alloy. Packed, c.l. 10.45c, ton lot 11.6c, less ton 12.45c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Carload bulk 26.25c per lb of alloy, carload, lump, packed 27.25c, ton lot 28.4c, less ton 29.65c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: 100 lb or more packed (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy; less than 100 lb $1.30. Delivered. Spot, add 5c. F.o.b. Washington, Pa., prices, 100 lb and over are as follows: Grade A (10-14 % B) 85c per lb; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si). Carload, bulk, lump, or 3" x D, $5.25 per lb of contained B. Packed, carload $5.40, ton to c.l. $5.50, less ton $5.60. Delivered.

Carbortam: (B 1 to 2%). Lump, carload $320 per ton, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Carload, lump, bulk 23c per lb of alloy, caload packed 24.25c, ton lot 26.15c, less ton 27.15c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.5-3%). Carload, lump, bulk 24c per lb of alloy, carload packed 25.65c, ton lot 27.95c, less ton 29.45c. Delivered. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx 3¾ lb each and containing 2 lb of Cr). Carload, bulk 19.60c per lb of briquet, in bags 20.70c; 3000 lb to c.l. pallets 20.80c; 2000 lb to c.l. in bags 21.90c; less than 2000 lb in bags 22.80c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx 3 lb and containing 2 lb of Mn). Carload, bulk 14.8c per lb of briquet; c.l., packed, bags 16c; 3000 lb to c.l., pallets 16c; 2000 lb to c.l., bags 17.2c; less ton 18.1c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx 3½ lb and containing 2 lb of Mn and approx ½ lb of Si). C.l. bulk 15.1c per lb of briquet; c.l. packed, bags 16.3c, 3000 lb to c.l., pallets 16.3c; 2000 lb to c.l., bags 17.5c; less ton 18.4c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx 5 lb and containing 2 lb of Si and small sizes, weighing approx 2½ lb and containing 1 lb of Si). Carload, bulk 8c per lb or briquet; packed, bags 9.2c; 3000 lb to c.l., pallets 9.6c; 2000 lb to c.l.; bags 10.8c; less ton 11.7c. Delivered. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each). $1.49 per lb of Mo contained, f.o.b. Langeloth, Pa.

Titanium Briquets: Ti 98.27%, $1 per lb, f.o.b. Niagara Falls, N. Y.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%). 5000 lb W or more $2.15 per lb (nominal) of contained W. Delivered.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Si 8% max, C 0.1% max). Ton lots 2" x D, $3.45 per lb of contained Cb; less ton lots $3.50 (nominal). Delivered.

Ferrotantalum Columbium: (Cb 40% approx, Ta 20% approx, and Cb plus Ta 60% min, C 0.30% max). Ton lots 2" x D, $3.05 per lb of contained Cb plus Ta, delivered; less ton lots $3.10.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Carlot bulk 19.25c per lb of alloy, c.l. packed ½ in. x 12 M 20.00c, ton lot 21.15c, less ton 22.40c. Delivered. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 20c per lb of alloy, ton lot 21.15c; less ton lot 22.4c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

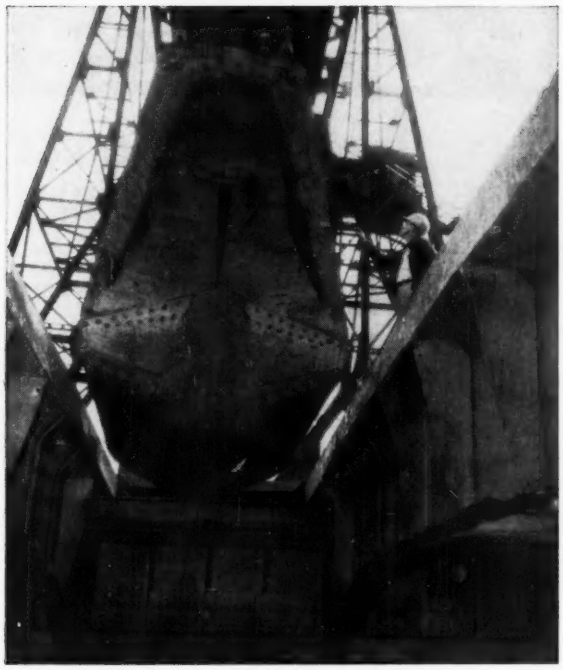
V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 18.45c per lb of alloy; ton lot 19.95c; less ton lot 21.20c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

Simanal: (Approx 20% each Si, Mn, Al; bal Fe). Lump, carload, bulk 19.25c. Packed c.l. 20.25c, 2000 lb to c.l. 21.25c; less than 2000 lb 21.75c per lb of alloy. Delivered.

Ferrophosporus: (23-25% based on 24% P content with unitage of $5 for each 1% of P above or below the base). Carload, bulk, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $120 per gross ton.

Ferromolybdenum: (55-75%). Per lb of contained Mo in 200-lb container, f.o.b. Langeloth and Washington, Pa., $1.76 in all sizes except powdered which is $1.82.

Technical Molybdic-Oxide: Per lb of contained Mo., in cans, $1.47; in bags, $1.46, f.o.b. Langeloth and Washington, Pa.



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AUCTION

COKE, GAS and CHEMICAL EQUIPMENT

of

CAMDEN COKE PLANT

Of The Public Service Electric & Gas Co.

Front & Chestnut Sts., Camden, N.J.

TO BE SOLD ON THE PREMISES—TO THE HIGHEST BIDDERS

TUESDAY, JUNE 23, 1959 AT 11 A.M. DST

The Public Service Electric & Gas Co. is ceasing the manufacture of coal gas at their Camden Coke Plant. All equipment used in this process is being liquidated. Certain coke processing and handling equipment is being retained until the disposal of the present stock of coke is completed.

American Pulverizer Ring Mill Crusher, type 38-S, 150/300 tons-per-hr. capacity. Penn Hammermill, size SXT-12, 125-tons-per-hr. Koppers Oven Charging Larry Cars, 10 ton capacity. Koppers Hydraulic Door Machines. Latimer Coal Spillage Bucket Elevator, 50 tons per hr., crushed coal Koppers Coke Oven Pusher 1947, 34′ C to C gauge, Atlas electric Coke Quenching Locomotive, standard gauge. Tippett & Wood Steel Sludge Settling Tanks, 42′ height. Steel Water Scrubbers 12′ diameter x 70′ height. Koppers steel inclined Drum Rotary Kiln, 4′ diameter x 30′ length. "Fluor Counter Flo" Cooling Tower 1954, Redwood with stainless steel fasteners. Koppers Elex Precipitator 8′5″ x 26′2″ height. Otis Elevator 118′6″ high travel, car size 2′10″ x 4′ x 7′4″ height. Complete Natural Gas-Air Jet Plant, 8 Schutte-Koerting Jets with rated capacity with 40-lb. gas; to produce 400 M-CFH, of 575 BTU gas. Five United Engineering Primary Coolers, 7′ diameter x 30′6″ height, Tar Decanter Separator 20′ x 46′ x 10′6″ deep, I-R Gas Compressors, duplex and compound types, I-R Turbo Exhausters 11,000-17,000 CFM capacity. Other Processing Equipment includes 2 Builders Coal Providence Proportioning and Weighing Equipment. Latimer Steel Bucket Elevator 15.2 tons-per-hr. Howe Larry Scale type 10-60. Koppers Hydraulic Door Machines, Koppers Steel Quenching Cars, Koppers and Barnes Coke Oven Gas-Air Reversing Mechanism. Hydraulic Door Jack. 2 Cottrell Gas Precipitators, Packaged Units designed to handle approx. 2 million cubic ft. coke oven gas per day. Patterson Hot Water Storage Heater, 500 gal. I-R, Elliott, and Alberger Barometric Condensers, 5,000/40,000 lbs. steam per hr. Sharples Sulphate Dehydrator Dryer Type C-20, 6 Andale After coolers, style 22 x A-12. Koppers Centrifugal Driers, 40″ basket. Hungerford & Terry Sand Filter, Research Engineering Mechanical Rectifiers, Koppers Ammonia Condenser, and Ammonia Still. Struther-Wells Heat Exchanger. United Filter Press, Sager Mud Mill, Lifting Magnets, and asstd. Rubber belt, steel Roller Conveyor Units, 13′11″ to 310′ long, 24″ to 42″ wide. Miscellaneous Plant Equipment includes: Terry 200 k. w. Steam Turbine, I-R single stage Air Compressors. Centrifugal, Reciprocating, Oil and Water Pumps, asstd. sizes. Large Steel Tanks, Recording Instruments, Generators, 956 New Cooler Tubes, 2″ diameter, 24′ long, #10 B-W gauge, C. I. Gas Valves 50 lb. and Machine Spare Parts. Rahn Larmon Gap Lathe, 24/48″ Swing x 6′ Gap, 16′ long. Landis heavy duty Pipe Threader 12″ capacity. Nat'l Bolt Threader, Cleveland Openside Planer 30″ x 8′ table, Nazel hydraulic Hammer size 4-D, Radial Drill, Toledo Hacksaw, Blount Grinder, Portable Electric Welders, small Bandsaw, Chain Falls, Pulley Blocks, Portable Electric Drills, Chipping and Scaling Hammers, Grease Gun Equipment, Space Unit Heaters, Fire Extinguishers, etc.

Exhibition: June 17, 18, 19 & 22 from 10 A.M. to 4 P.M.
or by appointment

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Scrap Index Slips a Little More

STEEL's composite on No. 1 heavy melting grade declines 34 cents to $33.33, lowest in over a year. No marked change is expected until steel labor situation is resolved

Scrap Prices, Page 162

• **Philadelphia**—There's no change in prices in the local market. Domestic business is at a virtual standstill, but export demand is zooming. Three boats are loading. One is taking on 14,400 tons of scrap for shipment to Japan. Two others are expected to be loaded before the end of May. Handlers think about 45,000 tons of scrap will be exported from the Philadelphia area this month.

• **New York** — Brokers' buying prices are unchanged throughout the list. Not much activity is noted in the market, but apparently enough business is being done to keep prices steady. Possibly the dullest spot is in machine shop turnings, on which prices are nominal. Contributing to steadiness in the open hearth grades is the fairly uniform flow of tonnage in the export market.

• **Chicago**—Steelmaking grades of scrap are down another $1 a ton on light sales, marking the end of two weeks of stability. No. 1 heavy melting of industrial origin sold for $34, delivered, No. 1 dealer heavy melting for $31, No. 2 heavy melting for $28, and No. 1 dealer bundles for $32. At the same time, rerolling rails dropped $1 to $56. Sales are limited and are of small tonnages. Cast iron grades and blast furnace material are holding.

• **Pittsburgh** — Railroad No. 1 heavy melting scrap dropped $1.90 to $37.10 on the latest list; other grades declined proportionately. Brokers think prices are close to rock bottom, but few expect an upturn before the signing of a new steel labor contract. In the absence of mill buying, the market may be sustained at current levels by brokers' purchases for their own accounts.

• **Cleveland** — Mills are marking time on purchases pending outcome of current labor contract negotiations. Despite the high level of steel production, mill interest in scrap is limited, though breakouts at a couple of blast furnaces in the Valley resulted in a slight increase in scrap use in that area. Prices are unchanged.

• **Youngstown**—The market continues sluggish. Observers doubt there'll be much change in conditions until the uncertainty over the labor situation is ended. No new orders are reported here, the mills being unwilling to commit themselves for more supplies. However, more scrap is being used by local steelmakers because of temporary interruptions in operations at some blast furnaces due to breakdowns.

• **Buffalo**—Open hearth steel, and the turnings grades of scrap have declined $1 a ton on new mill purchases for May delivery. No. 1 heavy melting is now quoted $31-$32, No. 2 heavy melting $26-$27, and No. 2 bundles $21-$22.

Machine shop turnings are off also, being quoted $16-$17. So are short shoveling turnings at $20-$21, and mixed borings and turnings at $18-$19. The railroad grades, low phos, and cast iron scrap are unchanged.

Scrap is moving freely, but dealers complain that the lower prices are drying up supplies.

• **Cincinnati** — Little change in prices is expected here until June at least. It is getting harder for brokers to buy dealer scrap, low prices serving to dry up tonnage. No. 1 heavy melting is still quoted $31.50-$32.50.

• **St. Louis**—The market is slow, but the prices, in general, are fairly steady. No. 1 cupola cast, clean auto cast, and No. 1 railroad heavy melting steel are off $1 a ton each, but the declines do not indicate any particular pattern of change.

The railroads are still withdrawing various kinds of scrap from their offerings because of the low prices. The mills are not eager to buy, and not much tonnage is being placed on the market.

• **Houston**—Scrap is more active on a moderate order from the Lone Star, Tex., mill. The order must be completed by June 15. Earlier, the Houston mill placed an order that also expires June 15.

On local scrap, brokers are quoting $33 for No. 1 heavy melting, $31 for No. 2 heavy melting, and $24 for No. 2 bundles on the Lone Star order. For scrap from areas with a $4.11 freight rate, the prices are $2 higher on the heavy melting

(*Please turn to Page* 168)

Iron and Steel Scrap

Consumer prices per gross ton, except as otherwise noted, including brokers' commission, as reported to STEEL, May 13, 1959. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

May 13	$33.33
May 6	33.67
Apr. Avg.	34.96
May 1958	33.21
May 1954	28.00

Based on No. 1 heavy melting grade at Pittsburgh, Chicago, and eastern Pennsylvania.

PITTSBURGH

No. 1 heavy melting	34.00-35.00
No. 2 heavy melting	32.00-33.00
No. 1 dealer bundles	*37.00-38.00*
No. 2 bundles	24.00-25.00
No. 1 busheling	34.00-35.00
No. 1 factory bundles	42.00-43.00
Machine shop turnings	19.00-20.00
Mixed borings, turnings	19.00-20.00
Short shovel turnings	24.00-25.00
Cast iron borings	24.00-25.00
Cut structurals:	
2 ft and under	43.00-44.00
3 ft lengths	42.00-43.00
Heavy turnings	30.00-31.00
Punchings & plate scrap	43.00-44.00
Electric furnace bundles	42.00-43.00

Cast Iron Grades

No. 1 cupola	45.00-46.00
Stove plate	45.00-46.00
Unstripped motor blocks	32.00-33.00
Clean auto cast	46.00-47.00
Drop broken machinery	51.00-52.00

Railroad Scrap

No. 1 R.R. heavy melt.	37.00-38.00
Rails, 2 ft and under	54.00-55.00
Rails, 18 in. and under	55.00-56.00
Random rails	*48.00-49.00*
Railroad specialties	*47.00-48.00*
Angles, splice bars	*50.00-51.00*
Rails, rerolling	61.00-62.00

Stainless Steel Scrap

18-8 bundles & solids	225.00-230.00
18-8 bundles & solids	*220.00-225.00*
18-8 turnings	*115.00-120.00*
430 bundles & solids	*120.00-125.00*

CHICAGO

No. 1 hvy melt., indus.	*33.00-34.00*
No. 1 hvy melt., dealer	*30.00-31.00*
No. 2 heavy melting	*27.00-28.00*
No. 1 factory bundles	37.00-38.00
No. 1 dealer bundles	*31.00-32.00*
No. 2 bundles	*21.00-22.00*
No. 1 busheling, indus.	*33.00-34.00*
No. 1 busheling, dealer	*30.00-31.00*
Machine shop turnings	15.00-16.00
Mixed borings, turnings	17.00-18.00
Short shovel turnings	17.00-18.00
Cast iron borings	17.00-18.00
Cut structurals, 3 ft	40.00-41.00
Punchings & plate scrap	41.00-42.00

Cast Iron Grades

No. 1 cupola	46.00-47.00
Stove plate	43.00-44.00
Unstripped motor blocks	38.00-39.00
Clean auto cast	53.00-54.00
Drop broken machinery	53.00-54.00

Railroad Scrap

No. 1 R.R. heavy melt.	36.00-37.00
R.R. malleable	57.00-58.00
Rails, 2 ft and under	52.00-53.00
Rails, 18 in. and under	53.00-54.00
Angles, splice bars	46.00-47.00
Axles	61.00-62.00
Rails, rerolling	*55.00-56.00*

Stainless Steel Scrap

18-8 bundles & solids	*210.00-215.00*
18-8 turnings	*110.00-115.00*
430 bundles & solids	120.00-125.00
430 turnings	55.00-60.00

YOUNGSTOWN

No. 1 heavy melting	35.00-36.00
No. 2 heavy melting	26.00-27.00
No. 1 busheling	35.00-36.00
No. 1 bundles	35.00-36.00
No. 2 bundles	23.00-24.00
Machine shop turnings	17.00-18.00
Short shovel turnings	22.00-23.00
Cast iron borings	22.00-23.00
Low phos	38.00-39.00
Electric furnace bundles	38.00-39.00

Railroad Scrap

No. 1 R.R. heavy melt.	38.00-39.00

CLEVELAND

No. 1 heavy melting	33.00-34.00
No. 2 heavy melting	24.00-25.00
No. 1 factory bundles	37.00-38.00
No. 1 bundles	33.00-34.00
No. 2 bundles	24.00-25.00
No. 1 busheling	33.00-34.00
Machine shop turnings	14.00-15.00
Short shovel turnings	20.00-21.00
Mixed borings, turnings	20.00-21.00
Cast iron borings	20.00-21.00
Cut foundry steel	35.00-36.00
Cut structurals, plates 2 ft and under	42.00-43.00
Low phos, punchings & plate	34.50-35.50
Alloy free, short shovel turnings	22.00-23.00
Electric furnace bundles	34.50-35.50

Cast Iron Grades

No. 1 cupola	47.00-48.00
Charging box cast	38.00-39.00
Heavy breakable cast	38.00-39.00
Stove plate	44.00-45.00
Unstripped motor blocks	33.00-34.00
Brake shoes	36.00-37.00
Clean auto cast	50.00-51.00
Burnt cast	37.00-38.00
Drop broken machinery	50.00-51.00

Railroad Scrap

R.R. malleable	65.00-66.00
Rails, 2 ft and under	57.00-58.00
Rails, 18 in. and under	58.00-59.00
Rails, random lengths	52.00-53.00
Cast steel	46.00-47.00
Railroad specialties	48.00-49.00
Uncut tires	42.00-43.00
Angles, splice bars	51.00-52.00
Rails, rerolling	58.00-59.00

Stainless Steel

(Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	215.00-220.00
18-8 turnings	110.00-115.00
430 clips, bundles, solids	115.00-125.00
430 turnings	45.00-55.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	34.00
No. 2 heavy melting	31.00
No. 1 bundles	37.00
No. 2 bundles	23.00
No. 1 busheling	37.00
Machine shop turnings	16.00†
Short shovel turnings	18.00†

Cast Iron Grades

No. 1 cupola	*49.00*
Charging box cast	42.00
Heavy breakable cast	40.00
Unstripped motor blocks	41.00
Clean auto cast	*49.00*
Stove plate	45.50

Railroad Scrap

No. 1 R.R. heavy melt.	*37.00*
Rails, 18 in. and under	49.00
Rails, random lengths	42.50
Rails rerolling	*52.00†*
Angles, splice bars	*44.00†*

BIRMINGHAM

No. 1 heavy melting	*29.00-30.00*
No. 2 heavy melting	*23.00-24.00*
No. 1 bundles	*29.00-30.00*
No. 2 bundles	21.00-22.00
No. 1 busheling	*29.00-30.00*
Cast iron borings	14.00-15.00
Machine shop turnings	*20.00-21.00*
Short shovel turnings	*21.00-22.00*
Bars, crops and plates	*38.00-39.00*
Structurals & plates	*37.00-38.00*
Electric furnace bundles	*34.00-35.00*
Electric furnace:	
2 ft and under	*33.00-34.00*
3 ft and under	*32.00-33.00*

Cast Iron Grades

No. 1 cupola	53.00-54.00
Stove plate	53.00-54.00
Charging box cast	29.00-30.00
Unstripped motor blocks	40.00-41.00
No. 1 wheels	39.00-40.00

Railroad Scrap

No. 1 R.R. heavy melt.	33.00-34.00
Rails, 18 in. and under	*48.00-49.00*
Rails, rerolling	*52.00-53.00†*
Rails, random lengths	*40.00-41.00*
Angles, splice bars	*42.00-43.00*

PHILADELPHIA

No. 1 heavy melting	33.00-34.00
No. 2 heavy melting	27.00-28.00
No. 1 bundles	36.00-37.00
No. 2 bundles	21.00-22.00
No. 1 busheling	35.00-36.00
Electric furnace bundles	38.00-39.00
Mixed borings, turnings	20.00†
Short shovel turnings	23.00-24.00
Machine shop turnings	19.00†
Heavy turnings	32.00-33.00
Structurals & plate	40.00-42.00
Couplers, springs, wheels	42.00-43.00
Rail crops, 2 ft & under	58.00-60.00

Cast Iron Grades

No. 1 cupola	41.00
Heavy breakable cast	43.00
Drop broken machinery	49.00-50.00
Malleable	67.00-68.00

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	26.00-27.00
No. 2 heavy melting	24.00-25.00
No. 1 bundles	26.00-27.00
No. 2 bundles	15.00-16.00
Machine shop turnings	9.00-10.00†
Mixed borings, turnings	12.00-13.00
Short shovel turnings	13.00-14.00
Low phos. (structurals & plates)	35.00-36.00

Cast Iron Grades

No. 1 cupola	36.00-37.00
Unstripped motor blocks	24.00-25.00
Heavy breakable	34.00-35.00

Stainless Steel

18-8 sheets, clips, solids	195.00-200.00
18-8 borings, turnings	85.00-90.00
410 sheets, clips, solids	55.00-60.00
430 sheets, clips, solids	85.00-90.00

BUFFALO

No. 1 heavy melting	*31.00-32.00*
No. 2 heavy melting	*26.00-27.00*
No. 1 bundles	*31.00-32.00*
No. 2 bundles	*21.00-22.00*
No. 1 busheling	*31.00-32.00*
Mixed borings, turnings	*18.00-19.00*
Machine shop turnings	*16.00-17.00*
Short shovel turnings	*20.00-21.00*
Cast iron borings	*18.00-19.00*
Low phos structurals and plate, 2 ft and under	41.00-42.00

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	46.00-47.00
No. 1 machinery	50.00-51.00

Railroad Scrap

Rails, random lengths	43.00-44.00
Rails, 3 ft and under	49.00-50.00
Railroad specialties	41.00-42.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	31.50-32.50
No. 2 heavy melting	26.50-27.50
No. 1 bundles	31.50-32.50
No. 2 bundles	20.00-21.00
No. 1 busheling	31.50-32.50
Machine shop turnings	15.00-16.00
Mixed borings, turnings	15.00-16.00
Short shovel turnings	17.00-18.00
Cast iron borings	16.50-17.50
Low phos., 18 in.	40.00-41.00

Cast Iron Grades

No. 1 cupola	43.00-45.00
Heavy breakable cast	39.00-40.00
Charging box cast	38.00-39.00
Drop broken machinery	48.00-49.00

Railroad Scrap

No. 1 R.R. heavy melt.	37.00-38.00
Rails, 18 in. and under	53.00-54.00
Rails, random lengths	46.00-47.00

HOUSTON

(Brokers' buying prices; f.o.b. cars)

No. 1 heavy melting	34.00
No. 2 heavy melting	31.00
No. 1 bundles	34.00
No. 2 bundles	20.00
Machine shop turnings	17.00
Short shovel turnings	20.00
Low phos. plates & structurals	41.00

Cast Iron Grades

No. 1 cupola	43.00
Heavy breakable	27.00-28.00†
Foundry malleable	37.00
Unstripped motor blocks	35.00

Railroad Scrap

No. 1 R.R. heavy melt.	34.00

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*24.00-24.50*
No. 2 heavy melting	*20.00-20.50*
No. 1 bundles	*24.00-24.50*
No. 1 busheling	*24.00-24.50*
Machine shop turnings	8.00-9.00
Short shovel turnings	10.00-11.00
No. 1 cast	33.00
Mixed cupola cast	33.00
No. 1 machinery cast	34.00

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*28.00-29.00*
No. 2 heavy melting	*18.00-19.00*
No. 1 bundles	*30.00-31.00*
No. 2 bundles	*17.00-18.00*
No. 1 busheling	*28.00-29.00*
Machine shop turnings	*10.00-11.00*
Mixed borings, turnings	*11.00-12.00*
Short shovel turnings	*11.00-12.00*

Cast Iron Grades

No. 1 cupola	39.00-40.00
Stove plate	30.00-31.00
Charging box cast	31.00-32.00
Heavy breakable	31.00-32.00
Unstripped motor blocks	19.00-20.00
Clean auto cast	43.00-44.00

SEATTLE

No. 1 heavy melting	*33.00*
No. 2 heavy melting	*31.00*
No. 1 bundles	*27.00†*
No. 2 bundles	*21.00*
Machine shop turnings	17.00
Mixed borings, turnings	17.00
Electric furnace No. 1	38.00†

Cast Iron Grades

No. 1 cupola	34.00
Heavy breakable cast	28.00†
Unstripped motor blocks	26.00
Stove plate (f.o.b. plant)	21.00†

LOS ANGELES

No. 1 heavy melting	38.00
No. 2 heavy melting	36.00
No. 1 bundles	35.00
No. 2 bundles	17.00
Machine shop turnings	15.00
Shoveling turnings	18.00
Cast iron borings	18.00
Cut structurals and plate 1 ft and under	49.00

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	47.00

Railroad Scrap

No. 1 R.R. heavy melt.	41.00

SAN FRANCISCO

No. 1 heavy melting	36.00
No. 2 heavy melting	33.00
No. 1 bundles	34.00
No. 2 bundles	22.00
Machine shop turnings	16.00
Mixed borings, turnings	16.00
Cast iron borings	16.00
Heavy turnings	16.00
Short shovel turnings	16.00
Cut structurals, 3 ft	42.00

Cast Iron Grades

No. 1 cupola	44.00
Charging box cast	34.00
Stove plate	34.00
Heavy breakable cast	28.00
Unstripped motor blocks	31.00
Clean auto cast	40.00
Drop broken machinery	40.00
No. 1 wheels	34.00

HAMILTON, ONT.

(Brokers' buying prices)

No. 1 heavy melting	32.25
No. 2 heavy melting	28.25
No. 1 bundles	32.25
No. 2 bundles	22.75
Mixed steel scrap	24.25
Mixed borings, turnings	13.00
Busheling, new factory: Prepared	32.25
Unprepared	26.25
Short steel turnings	17.00

Cast Iron Grades‡

No. 1 machinery cast	46.50-48.00

†Nominal.
‡F.o.b. Hamilton, Ont.

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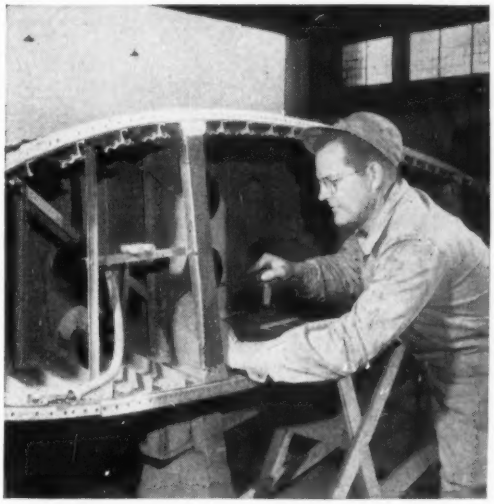

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STEEL
The Metalworking Weekly

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Agree to Lead-Zinc Cutbacks

World producers at UN meeting put voluntary curtailment on production and exports of the two metals. Opinion is split as to ultimate effectiveness. Lead price up

Nonferrous Metal Prices, Pages 166 & 167

MAJOR LEAD and zinc producing and consuming nations have taken what they hope is a big leap forward in firming the world market.

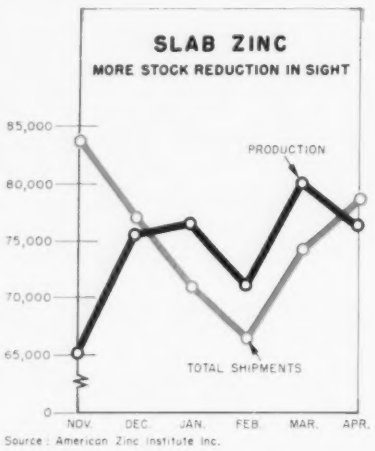
At recently concluded talks at the United Nations, for the first time delegates readily agreed a real problem of overabundance exists. Their solution: Voluntary curtailments in production and exports to whittle down excesses of metal and concentrates that have saturated world consuming centers, particularly the U. S.

• Hoped for—UN spokesmen estimate that announced intentions of producers would lower 1959's lead metal surplus, originally pegged at 168,000 tons, to an annual rate of 66,080 tons in the second half. For zinc, the drop would be from 134,400 tons to an annual rate of 17,920 tons.

• **Reactions Mixed**—The UN development brings varying opinions from American producers. For example, American Metal Climax Inc. says it is in perfect agreement with the announcement and "intends to co-operate wholeheartedly with the recommendations of the UN." The company says it will immediately reduce yearly distribution from its Mexican properties by 6500 tons for lead and 2000 tons for zinc, and that effective July 1, it is trimming output at its Blackwell, Okla., zinc smelter by 4000 tons annually.

Simon D. Strauss, vice president-sales for American Smelting & Refining Co., calls the UN action, "definitely a step in the right direction."

Some industry executives are not so enthusiastic. Typical is Andrew Fletcher, president of St. Joseph Lead Co., who agrees the UN action may be a "first step," but doubts the adequacy of voluntary control efforts on world output. Says Mr. Fletcher: "We still believe that the most equitable solution to the problem of excessive imports of lead and zinc to the U. S. is a tariff that would apply only when the domestic prices of lead and zinc fall below levels needed to maintain an adequate domestic mining industry."



Source: American Zinc Institute Inc.

• **The Hitch**—There's a strong current of "you'll have to show me" feeling among U. S. producers. They make these points: There's no way to police these agreements to make sure the nation or company is doing what it says it is. Furthermore, a producer could decide at any time to knock off his self-imposed production and export restrictions, and uncommitted producers could bring about chaos by taking advantage of the world market situation.

• **Watching and Waiting** — Our own government will pay close attention to the results of voluntary controls, but it doesn't anticipate any early move to amend our present system of quotas, say Washington sources. A Capitol Hill observer says the UN action might delay Congressional consideration of several lead-zinc bills now pending but certainly won't permanently forestall action on them.

• **Lead Price Up** — Certainly the announcement was a bullish influence on the market. Coupled with a somewhat stronger demand and a firming in the scrap market, it triggered a 0.5 cent boost in the lead price to 12 cents a pound on May 7. Leadmen admit the price pattern over the next few weeks isn't clear. Says one: "If buyers are convinced this is the turning point, prices will go up."

The zinc picture is equally cloudy. April sales were the best since November (see chart). The figures don't represent hedge buying either, say metalmen, but rather normal consumption levels brought about by the decline in overstocked inventories. Zinc is subject to the same pressures as lead as the result of the UN meeting, but consensus is the bullish sentiments will be tempered by an anticipated decrease in sales to galvanizers as the steel contract deadline draws near.

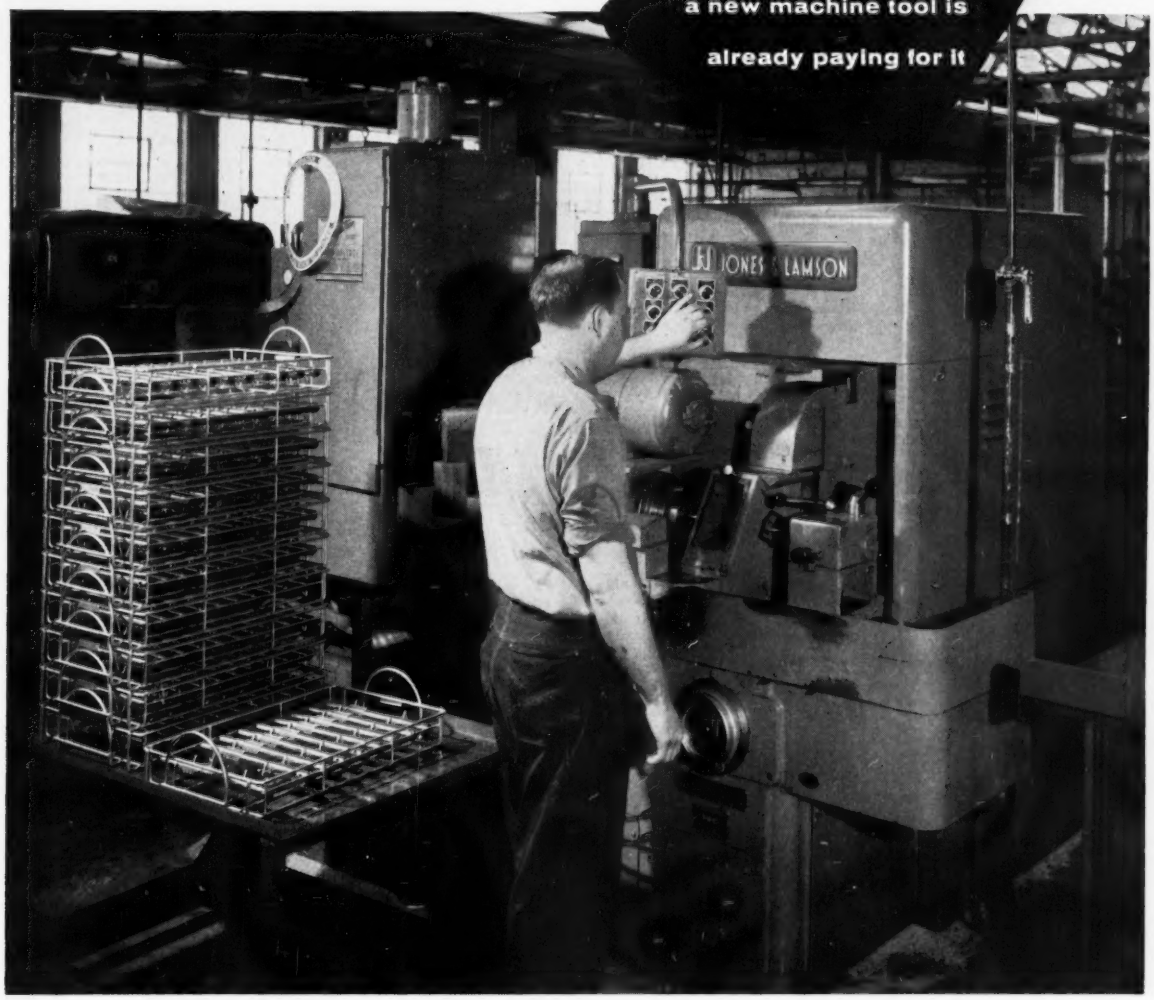
NONFERROUS PRICE RECORD

	Price May 13	Last Change	Previous Price	Apr. Avg	Mar. Avg	May, 1958 Avg
Aluminum	24.70	Aug. 1, 1958	24.00	24.700	24.700	24.000
Copper	31.50-32.00	Apr. 30, 1959	31.50-32.50	32.404	32.031	24.433
Lead	11.80	May 7, 1959	11.30	10.992	11.238	11.512
Magnesium	35.25	Aug. 13, 1956	33.75	35.250	35.250	35.250
Nickel	74.00	Dec. 6, 1956	64.50	74.000	74.000	74.000
Tin	103.00	Ma 13, 1959	102.625	102.490	103.000	94.510
Zinc	11.00	Feb. 25, 1959	11.50	11.000	11.000	10.000

Quotations in cents per pound based on: COPPER, mean of primary and secondary, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary pig, 99.5+%, f.o.b. shipping point; MAGNESIUM, pig 99.8%, Velasco, Tex.

JONES & LAMSON FORM GRINDERS

the man who needs a new machine tool is already paying for it



Rapid, precise form grinding with PFC keeps outboard motor production at full throttle

The new V-type construction of Evinrude's smooth-running outboard motors is giving power-packed pleasure to boat owners.

In the initial stages of production, however, this new motor posed new, tough manufacturing problems for Evinrude production men.

For example: the prime moving parts of this balanced outboard design are short, rigid crankshafts. The pins of these crankshafts had to be ground to .0005″ tolerances on diameter, and to .0001″ taper on the length of the pin. Required production: 110 pieces per hour.

J & L Model E Form Grinders proved to be a key factor in meeting these rigid production requirements while maintaining highest quality standards.

In another Model E application on the same motor, two grooves are formed from the solid in stainless steel propeller shafts at a rate of 146 parts per hour (illustrated). There is *no time out for wheel dressing*, because this machine is equipped with PFC (Perpetual Form Control).

This sort of grinding efficiency can keep *your* production roaring at full throttle, too. Write for detailed information. Jones & Lamson Machine Company, 517 Clinton Street, Springfield, Vermont.

Turret Lathes • Automatic Lathes • Tape Controlled Machines • Thread & Form Grinders • Optical Comparators • Thread Tools

Nonferrous Metals

Cents per pound, carlots except as otherwise noted.

PRIMARY METALS AND ALLOYS

Aluminum: 99.5%, pigs, 24.70; ingots, 26.80, 30,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 28.60; No. 43, 28.40; No. 195, 29.40; No. 214, 30.20; No. 356, 28.60; 30 or 40 lb ingots.

Antimony: R.M.M. brand, 99.5%, 29.00; Lone Star brand, 29.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 24.50-25.00, New York, duty paid, 10,000 lb or more.

Beryllium: 97% lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $74.75 per lb of contained Be, with balance as Al at market price, f.o.b. shipping point.

Beryllium Copper: 3.75-4.75% Be, $43 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. shipping point.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.20 per lb deld.

Cobalt: 97.99%, $1.75 per lb for 500-lb keg, $177 per lb for 100 lb case; $1.82 per lb under 100 lb.

Columbium: Powder, $55-85 per lb, nom.

Copper: Electrolytic, 31.50 deld.; custom smelters, 32.00; lake, 31.50 deld.; fire refined, 31.25 deld.

Germanium: First reduction, less than 1 kg, 41.00 per gram; 1-10 kg, 37.00 per gram; intrinsic grade, 35.00-37.00 per gram.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $75-80 nom. per troy oz.

Lead: Common, 11.80; chemical, 11.90; corroding, 11.90, St. Louis, New York basis, add 0.20.

Lithium: 1 lb or 2 lb ingots, less than 100 lb, $11 per lb; 100-500 lb, $9.50 per lb; 500 lb or more, $9 per lb. All prices deld.

Magnesium: Pig, 35.25; ingot, 36.00 f.o.b. Velasco, Tex.; 12 in. sticks, 59.00 f.o.b. Madison, Ill.

Magnesium Alloys: AZ91A (diecasting), 40.75 deld.; AZ63A, AZ92A, AZ91C (sand casting), 40.75, f.o.b. Velasco, Tex.

Mercury: Open market, spot, New York, $245-249 per 76 lb flask.

Molybdenum: Unalloyed, turned extrusion, 3.75-5.75 in. round, $9.60 per lb in lots of 2500 lb or more, f.o.b. Detroit.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 74.00; 10-lb pigs, unpacked, 78.25; "XX" nickel shot, 79.50; "F" nickel shot for addition to cast iron, 74.50; "F" nickel, 5 lb ingots in kegs for addition to cast iron, 75.50. Prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 1.01. Nickel oxide sinter at Buffalo, New York, or other established U. S. points of entry, contained nickel, 69.60.

Osmium: $70-100 per troy oz nom.

Palladium: $18-20 per troy oz.

Platinum: $77-80 per troy oz from refineries.

Radium: $16-21.50 per mg radium content, depending on quantity.

Rhodium: $122-125 per troy oz.

Ruthenium: $55-60 per troy oz.

Selenium: $7.00 per lb, commercial grade.

Silver: Open market, 91.375 per troy oz.

Sodium: Solid pack, c.l., 19.50; l.c.l., 20.00; brick, c.l., 21.00; l.c.l., 21.50; tank car, 17.00.

Tantalum: Rod, $60 per lb; sheet, $55 per lb.

Tellurium: $2.00-2.20 per lb.

Thallium: $7.50 per lb.

Tin: Straits, N. Y., spot and prompt, 103.00.

Titanium: Sponge, 99.3 + % grade A-1, ductile (0.3% Fe max.), $1.62-1.82; grade A-2 (0.5% Fe max.), $1.70 per lb.

Tungsten: Powder, 98.8%, carbon reduced, 1000-lb lots, $2.75-2.90 per lb nom., f.o.b. shipping point; less than 1000 lb, add 15.00; 99 + % hydrogen reduced, $3.30-3.80.

Zinc: Prime Western, 11.00; brass special, 11.25; intermediate, 11.50, East St. Louis, freight allowed over 0.50 per lb, New York basis, add 0.50. High grade, 12.00; special high grade, 12.25 deld. Diecasting alloy ingot No. 3, 13.50; No. 2, 14.00; No. 5, 13.75 deld.

Zirconium: Reactor grade sponge, 100 lb or less, $7 per lb; 100-500 lb, $6.50 per lb; over 500 lb, $6 per lb.

(Note: Chromium, manganese, and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 23.875-25.25; No. 12 foundry alloy (No. 2 grade), 21.75-22.00; 5% silicon alloy, 0.60 Cu max., 24.75-25.00; 13 alloy, 0.60 Cu max., 24.75-25.00; 195 alloy, 25.25-26.00; 108 alloy, 22.25-22.50. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 23.75; grade 2, 22.50; grade 3, 21.25; grade 4, 19.75.

Brass Ingot: Red brass No. 115, 30.25; tin bronze, No. 225, 41.25; No. 245, 35.00; high-leaded tin bronze, No. 305, 34.50; No. 1 yellow, No. 405, 24.75; manganese bronze, No. 421, 27.75.

Magnesium Alloy Ingot: AZ63A, 37.50; AZ91B, 37.50; AZ91C, 41.25; AZ92A, 37.50.

NONFERROUS PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb; nom. 1.9% Be alloy.) Strip, $1.91, f.o.b. Temple, Pa., or Reading, Pa.; rod, bar, wire, $1.89, f.o.b. Temple, Pa.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 20,000-lb lots, 36.855; l.c.l., 37.48. Weatherproof, 20,000-lb lots, 37.42; l.c.l., 38.17.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more, $18.00 per cwt; pipe, full coils, $18.00 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill.) Sheet and strip, $7.50-17.00; sheared mill plate, $5.25-10.00; wire, $5.75-10.00; forging billets, $3.55-5.75; hot-rolled and forged bars, $4.25-7.50.

ZINC

(Prices per lb, c.l., f.o.b. mill.) Sheets, 26.00; ribbon zinc in coils, 21.50; plates, 20.00.

ZIRCONIUM

Plate, $12.50-19.20; H.R. strip, $12.50-22.90; C.R. strip, $15.90-31.25; forged or H.R. bars, $11.00-17.40.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheets, C.R.	126	106	128
Strip, C.R.	124	108	138
Plate, H.R.	120	105	121
Rod, Shapes, H.R.	107	89	109
Seamless Tubes	157	129	200

ALUMINUM

Sheets: 1100, 3003 and 5005 mill finish (30,000 lb base; freight allowed).

Thickness Range Inches	Flat Sheet	Coiled Sheet
0.250-0.136	42.80-47.30	....
0.136-0.096	43.20-48.30	....
0.126-0.103	....	39.20-39.80
0.096-0.077	43.80-50.00	39.30-40.00
0.077-0.068	44.30-52.20	....
0.077-0.061	....	39.50-40.70
0.068-0.061	44.30-52.20	....
0.061-0.048	44.90-54.40	40.10-41.80
0.048-0.038	45.40-57.10	40.60-43.20
0.038-0.030	45.70-62.00	41.00-45.70
0.030-0.024	46.20-53.70	41.30-45.70
0.024-0.019	46.90-56.80	42.40-44.10
0.019-0.017	47.70-54.10	43.00-44.70
0.017-0.015	48.60-55.00	43.80-45.50
0.015-0.014	49.60	44.80-46.50
0.014-0.012	50.80	45.50
0.012-0.011	51.00	46.70
0.011-0.0095	53.50	48.10
0.0095-0.0085	54.60	49.60
0.0085-0.0075	56.20	50.80
0.0075-0.007	57.70	52.30
0.007-0.006	59.30	53.70

ALUMINUM (continued)

Plates and Circles: Thickness 0.250-3 in. 24-60 in. width or diam., 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	42.40	47.20
5050-F	43.50	48.30
3004-F	44.50	50.20
5052-F	45.10	50.90
6061-T6	45.60	51.70
2024-T4	49.30	56.10
7075-T6*	57.60	64.70

*24-48 in. width or diam., 72-180 in. lengths.

Screw Machine Stock: 30,000 lb base.

Diam. (in.) or across flats*	Round 2011-T3	Round 2017-T4	Hexagonal 2011-T3	Hexagonal 2017-T4
0.125	76.90	73.90	....	....
0.250	62.00	60.20	89.10	76.60
0.375	61.20	60.00	73.50	68.50
0.500	61.20	60.00	73.50	68.50
0.625	61.20	60.00	69.80	64.20
0.750	59.70	58.40	63.60	60.40
0.875	59.70	58.40	63.60	60.40
1.000	59.70	58.40	63.60	60.40
1.125	57.30	56.10	61.50	58.30
1.250	57.30	56.10	61.50	58.30
1.350	57.30	56.10	61.50	58.30
1.500	57.30	56.10	61.50	58.30
1.625	55.00	53.60	....	56.20
1.750	55.00	53.60	60.30	56.20
1.875	55.00	53.60	....	56.20
2.000	55.00	53.60	60.30	56.20
2.125	53.50	52.10	....	....
2.250	53.50	52.10	....	56.20
2.375	53.50	52.10	....	....
2.500	53.50	52.10	....	56.20
2.625	....	50.40	....	....
2.750	51.90	50.40	....	56.20
2.875	....	50.40	....	....
3.000	51.90	50.40	....	56.20
3.125	....	50.40	....	....
3.250	....	50.40	....	....
3.375	....	50.40	....	....

*Selected sizes.

Forging Stock: Round, Class 1, random lengths, diam., 0.375-8 in., "F" temper; 2014, 42.20-55.00; 6061, 41.60-55.00; 7075, 61.60-75.00; 7070, 66.60-80.00.

Pipe: ASA schedule 40, alloy 6063-T6 standard length, plain ends, 90,000 lb base, dollars per 100 ft. Nominal pipe sizes: ⅜ in., 18.85; 1 in., 29.75; 1¼ in., 40.30; 1½ in., 48.15; 2 in., 58.30; 4 in., 160.20; 6 in., 287.55; 8 in., 432.70.

Extruded Solid Shapes:

Factor	Alloy 6063-T5	Alloy 6062-T6
9-11	42.70-44.20	51.30-55.50
12-14	42.70-44.20	52.00-56.50
15-17	42.70-44.20	53.20-58.20
18-20	43.20-44.70	55.20-60.80

MAGNESIUM

Sheet and Plate: AZ31B standard grade, 0.32 in., 103.10; .081 in., 77.90; .125 in., 70.40; .188 in., 69.00; .250-2.0 in., 67.90. AZ31B spec. grades, .032 in., 171.30; .081 in., 108.80; .125 in., 98.10; .188 in., 95.70; .250-2.00 in., 93.30. Tread plate, 60-192 in. lengths, 24-72 in. widths; .125 in., 74.90; .188 in., 71.70-72.10; .25-.75 in., 70.60-71.60. Tooling plate, 0.25-3.0 in., 73.00.

Extruded Solid Shapes:

Factor	Com. Grade (AZ31C)	Spec. Grade (AZ31B)
6-8	65.30-67.60	84.60-87.40
12-14	65.30-67.60	85.70-88.00
24-26	66.10-75.30	90.60-91.30
36-38	66.10-75.30	104.20-105.30

NONFERROUS SCRAP

DEALERS' BUYING PRICES

(Cents per pound, New York in ton lots.)

Copper and Brass: No. 1 heavy copper and wire, 24.50-25.00; No. 2 heavy copper and wire, 22.50-23.00; light copper, 20.50-21.00; No. 1 composition red brass, 19.00-19.50; No. 1 com-

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES e (Based on copper at 31.50c)		
	Sheets, Strip, Plate	Rod	Wire	Seamless Tubes	Clean Heavy	Rod Ends	Clean Turnings
Copper	55.63b	52.86c	....	55.82	27.500	27.500	26.750
Yellow Brass	48.24	32.73d	48.78	51.65	20.625	19.750	18.750
Low Brass, 80%	51.23	51.17	51.77	54.54	23.250	23.000	22.500
Red Brass, 85%	52.29	52.23	52.83	55.60	24.250	24.000	23.500
Com. Bronze, 90%	53.90	53.84	54.44	56.96	25.125	24.875	24.375
Manganese Bronze	56.54	50.14	60.62	....	19.125	18.875	18.375
Muntz Metal	50.85	46.16	....	....	19.375	19.125	18.625
Naval Brass	52.80	46.61	59.36	56.21	19.125	18.875	18.375
Silicon Bronze	60.67	59.86	60.21	78.35	27.000	26.750	26.000
Nickel Silver, 10%	63.82	66.15	66.15	....	25.500	25.250	12.625
Phos. Bronze	75.34	75.84	75.84	77.02	28.625	28.375	25.750

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb.

position turnings, 18.00-18.50; new brass clippings, 17.50-18.00; light brass, 13.00-13.50; heavy yellow brass, 14.00-14.50; new brass rod ends, 15.00-15.50; auto radiators, unsweated, 14.50-15.00; cocks and faucets, 15.50-16.00; brass pipe, 15.50-16.00.

Lead: Soft scrap lead, 7.75-8.25; battery plates, 2.25-2.50; linotype and stereotype, 9.25-9.75; electrotype, 7.75-8.25; mixed babbitt, 9.50-10.00.

Monel: Clippings, 26.00-28.00; old sheets, 23.00-25.00; turnings, 20.00-21.00; rods, 26.00-28.00.

Nickel: Sheets and clips, 52.00-54.00; rolled anodes, 52.00-54.00; turnings, 38.00-40.00; rod ends, 52.00-54.00.

Zinc: Old zinc, 3.25-3.50; new diecast scrap, 3.00-3.25; old diecast scrap, 1.75-2.00.

Aluminum: Old castings and sheets, 9.75-10.25; clean borings and turnings, 6.25-6.75; segregated low copper clips, 13.00-13.50; segregated high copper clips, 13.00-13.50; mixed low copper clips, 12.00-12.50; mixed high copper clips, 11.00-11.50.

(Cents per pound, Chicago)

Aluminum: Old castings and sheets, 11.75-12.25; clean borings and turnings, 9.50-10.00; segregated low copper clips, 16.75-17.25; segregated high copper clips, 15.75-16.25; mixed low copper clips, 16.00-16.50; mixed high copper clips, 15.25-15.75.

(Cents per pound, Cleveland)

Aluminum: Old castings and sheets, 10.50-11.00; clean borings and turnings, 9.50-10.00; segregated low copper clips, 14.50-15.00; segregated high copper clips, 13.00-13.50; mixed low copper clips, 13.50-14.00; mixed high coppel clips, 12.50-13.00.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)
Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 57.50; light scrap, 52.50; turnings and borings, 37.50.

Copper and Brass: No. 1 heavy copper and wire, 27.25; No. 2 heavy copper and wire, 26.00; light copper, 23.75; refinery brass (60% copper) per dry copper content, 25.50.

INGOTMAKERS' BUYING PRICES

Copper and Brass: No. 1 heavy copper and wire, 27.25; No. 2 heavy copper and wire, 26.00; light copper, 23.75; No. 1 composition borings, 20.50; No. 1 composition solids, 21.00; heavy yellow brass solids, 15.00; yellow brass turnings, 14.00; radiators, 16.00.

PLATING MATERIAL

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes, $1.20.

Copper: Flat-rolled, 47.79; oval, 46.00, 5000-10,000 lb; electrodeposited, 40.50, 2000-5000 lb lots; cast, 43.00, 5000-10,000 lb quantities.

Nickel: Depolarized, less than 100 lb, 114.25; wire, 27.00; No. 2 heavy copper and wire, 26.00; light copper, 23.75; refinery brass deduct 3 cents a lb.

Tin: Bar or slab, less than 200 lb, 121.50; 200-499 lb, 120.00; 500-999 lb, 119.50; 1000 lb or more, 119.00.

Zinc: Balls, 18.00; flat tops, 18.00; flats, 20.75; ovals, 20.00, ton lots.

CHEMICALS

Cadmium Oxide: $1.30 per lb in 100-lb drums.
Chromic Acid (flake): 100-2000 lb, 31.00; 2000-10,000 lb, 30.50; 10,000-20,000 lb, 30.00; 20,-000 lb or more, 29.50.

Copper Cyanide: 100-200 lb, 65.90; 300-900 lb, 63.00; 1000-19,900 lb, 61.90.

Copper Sulphate: 100-1900 lb, 15.30; 2000-5900 lb, 13.30; 6000-11,900 lb, 13.05; 12,000-22,900 lb, 12.80; 23,000 lb or more, 12.30.

Nickel Chloride: 100 lb, 45.00; 200 lb, 43.00; 300 lb, 42.00; 400-4900 lb, 40.00; 5000-9900 lb, 38.00; 10,000 lb or more, 37.00.

Nickel Sulphate: 5000-22,999 lb, 29.00; 23,000-39,990 lb, 28.50; 40,000 lb or more, 28.00.

Sodium Cyanide (Cyanobrik): 200 lb, 20.80; 400-800 lb, 19.80; 1000-19,800 lb, 18.80; 20,000 lb or more, 17.80.

Sodium Stannate: Less than 100 lb, 80.10; 100-600 lb, 70.70; 700-1900 lb, 68.00; 2000-9900 lb, 66.10; 10,000 lb or more, 64.80.

Stannous Chloride (Anhydrous): 25 lb, 155.60; 100 lb, 150.70; 400 lb, 148.30; 800-19,900 lb, 107.40; 20,000 lb or more, 101.30.

Stannous Sulphate: Less than 50 lb, 140.70; 50 lb, 110.70; 100-1900 lb, 108.70; 2000 lb or more, 106.70.

Zinc Cyanide: 100-200 lb, 59.00; 300-900 lb, 57.00.

MODERN OVERHEAD CRANES

CAN BE INSPECTED IN OPERATION

Capacity	Name	Span	Lift
150 Tons (2-75 T. Trolleys)	Shepard Niles	100'	39'
20 Tons (2-10 T. Trolleys)	N.B.P.	71' 10"	25' 6"

(All Cranes 230 Volts DC—All Late Model Cranes)
(ATTRACTIVELY PRICED FOR QUICK REMOVAL)

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Suite 5 **34 Main St. W.** **Rochester 14, N. Y.**

PHONE **WIRE** **WRITE**

Mr. Schwartz—LOcust 2-6362

CLASSIFIED

Help Wanted

EXPERIENCED SHEET PRODUCTION SUPERINTENDENT. Immediate opening for superintendent with background in aluminum strip and sheet rolling. Prefer Mechanical Engineering Degree, or equivalent, with 3-4 years experience. Must have working knowledge of plant layout and auxiliary equipment. Modern installation in growing Mid-southern community. Independent aluminum production. In resume give age, family, references, experience and salary requirement. Enclose photograph. Reply Box 753, STEEL, Penton Bldg., Cleveland 13, Ohio.

Analytical chemist for stainless steel foundry. Must be a graduate with ability to qualify for chief chemist. Equipment includes spectroscope. **Write Box 763, STEEL, Penton Bldg., Cleveland 13, Ohio.**

Reinforcing steel yard foreman trainee; knowledge of blue print estimating and detailing; age 24-39; write to Rinker Materials Corp., P. O. Box 231, W. Palm Beach, Fla.

Representatives Wanted

WANTED: MANUFACTURERS' AGENT for New England territory to represent light hammer closed die forge plant. Please send particulars and lines now represented. Box 760, STEEL, Penton Bldg., Cleveland 13, Ohio.

Positions Wanted

MANUFACTURING EXECUTIVE
All Types of manufacturing, Stampings, Heavy Machining and Equipment, Automotive. Excelling in Production Control, Tooling, Tool and Product Design. Composite experience in Purchasing, Logistics, Personnel etc. Have been on foreign assignments in complete control of all phases in setting up manufacturing facility. Knowledge of Export and Import Procedures. Speak Spanish. Interested in five figure salary with benefits. Highest integrity and capabilities. Will accept foreign assignment. Reply Box 764, STEEL, Penton Bldg., Cleveland 13, Ohio.

SALES MANAGER with 25 years experience in steel tubular products will relocate. Reply Box 765, STEEL, Penton Bldg., Cleveland 13, Ohio.

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And Further Information write
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WANTED METALLURGIST
Opportunity for graduate engineer experienced in furnace operations and quality control of ferroalloy production, especially chrome, silicon and manganese. Southern locations. Preferred age, in thirties. Salary open. All correspondence treated strictly confidential. Address reply to:
Walter E. Remmers
President
Pittsburgh Metallurgical Co., Inc.
Box 368 **Niagara Falls, N. Y.**

(*Concluded from Page 161*)

grades, and $1 higher on bundles.

With both mills taking scrap, shippers are assured of a fairly active period.

Texas border scrapmen are working on a fair-sized Mexican order on which brokers are paying $37 for No. 1, and $34 for No. 2, delivered border points.

• **Birmingham**—A large local electric furnace operator placed his May scrap orders at prices $1 to $2 a ton under his last purchase. Foundries also have cut their prices on steel scrap. Purchases of cast iron scrap by pipe manufacturers have increased, and prices are unchanged on that grade. Brokers say dealer resistance to price cuts is increasing; they are having difficulty filling orders. Dealer intake continues slow.

• **Detroit**—Prices moved up slightly on the strength of orders by Great Lakes Steel Corp. and Ford Motor Co. Dealers feel the move is insignificant, but brokers say it may indicate improvement in local market conditions.

• **Seattle**—Lack of new export business and desultory buying by domestic consumers have resulted in a further weakening of prices. No. 1 heavy melting is now quoted $33, and No. 2 heavy melting $31, both grades being off $2 a ton. The outlook is uncertain. No signs of improvement in demand are seen.

• **San Francisco** — Although the steel mills are operating at capacity in this district (one being engaged at 111 per cent), the movement of steel scrap continues sluggish.

• **Los Angeles**—Demand is weaker. The domestic mills are not adding much tonnage to their inventories, and it's reported Japan is cutting its recent huge order in half.

Distributors . . .

Prices, Page 156

The steel service centers report a steady increase in business. They find it encouraging, but "nothing sensational." Most of the buying is being done by regular customers, and reflects higher consumption rather than scare buying.

"Sales are picking up," a Pittsburgh distributor says, "but not as much as you'd expect when all the mills are sold out for the first half. We may see a last minute rush next month if it looks like a strike is unavoidable."

Structural Shapes . . .

Structural Shape Prices, Page 151

Although far from the peak of several weeks ago, structural steel demand has picked up at some market centers. In the East, there is more bridgework and miscellaneous commercial inquiry is more active. Most large and medium size fabricating shops can no longer accept work for delivery before late September, even assuming no steel strike this summer.

Various fabricating shops have labor contracts which run through the summer, and in some cases beyond. So even if there's a strike against steel producers, they shouldn't be confronted with labor stoppages at the same time. Their main problem this summer will be to have sufficient inventories to proceed fairly comfortably with work in hand. They are driving hard to get all the tonnage promised them for delivery before July 1. In some cases, they are seeking to place additional tonnage with the mills.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

2000 tons, agricultural-engineering buildings, University of West Virginia, Morgantown, W. Va., to Levinson Steel Co., Pittsburgh; John McShain Inc., Baltimore, general contractor.

1115 tons, state highway structures, Greenfield-Bernardston, Mass., to Haarmann Steel Co., Holyoke, Mass.; Daniel O'Connell's Sons Corp., Holyoke, general contractor.

688 tons, 150 tons of reinforcing bars two Washington State highway spans, Yakima County, to Bethlehem Pacific Coast Steel Corp., Seattle; John E. Alexander, Seattle, general contractor.

433 tons, state bridgework, Queens County, New York, through Slattery Construction Co., general contractor, to Pine Brook Iron Works, Scranton, Pa.

350 tons, structurals and reinforcing bars high school, Stamford, Conn., to Leake & Nelson Co., Bridgeport (structurals), and Fireproof Products Co., New York (reinforcing bars); George L. Hickey, Inc., Stamford, general contractor.

275 tons, plant for R. T. French, Shelley, Idaho, to Gate City Steel Inc., Boise, Idaho.

225 tons, petroleum lubrication facilities, Naval Radio Station, Cutler, Maine, to Bancroft & Martin Rolling Mills Co., South Portland, Maine; Robert A. Verrier Construction Co., Portland, Maine, general contractor.

170 tons, bridge at Greer's ferry dam, Arkansas, to Gate City Steel Inc., Boise, Idaho; Morrison-Knudsen Co. general contractor.

150 tons, four galvanized steel radio relay towers, Spokane to Seattle, to Gate City Steel Inc., Boise, Idaho.

135 tons, courthouse and federal building, Minneapolis, Minn., to Standard Iron & Wire Co.; Ring Construction Co., Minneapolis, general contractor.

100 tons, building, Lafayette National Bank, Brooklyn, N. Y., through George F. Driscoll Co., general contractor, to County Line Iron Works.

STRUCTURAL STEEL PENDING

6300 tons, transmission towers, Niagara County, New York, for New York State Power Authority, bids May 21.

3615 tons, miscellaneous state bridgework in Warren, Onondaga, Columbia, and Bronx Counties, New York; bids closed May 14.

2000 tons, state bridgework, Bronx, N. Y., Gull Contracting Co., Flushing, N. Y., low on general contract.

1700 tons, spillway gates, locks, etc., Ice Harbor Dam, Snake River; Guy F. Atkinson Co., South San Francisco, low at $20,744,405 to the U. S. Engineer, Walla Walla, Wash.

1500 tons, municipal incinerator, Hamilton Avenue, Brooklyn, N. Y.; bids May 20.

900 tons, New York Telephone Co. building, Scarsdale, N. Y.; bids closed May 15.

500 tons, Grace Institute, Lexington Avenue and E. 75th Street, New York; bids closed.

455 tons, state bridgework, Chemung County, New York, Bero Construction Co., Buffalo, low on general contract.

400 tons, state bridgework, Cattaraugus and Erie Counties, New York, Union Concrete Construction Co. low on general contract.

365 tons, highway office building, Boise, Idaho; Gate City Steel Inc., Boise, is low bidder; R. E. Rice Construction Co., Boise, general contractor.

335 tons, embedded structural steel guides, sills and head beams, intake gates and stoplogs, Niagara contract NP-39; bids June 2, Power Authority, State of New York.

100 tons or more, hangar addition and other buildings, Ft. Richardson, Alaska, air base; Lease Co, Inc., Seattle, is low at $597,962 to U. S. Engineer.

REINFORCING BARS . . .

REINFORCING BARS PLACED

2000 tons, Bon Marche parking garage, Seattle, to Joseph T. Ryerson & Son Inc., Seattle; Utah Construction Co., Seattle, general contractor.

1500 tons, ballistics center, eastern Washington State, to Bethlehem Pacific Coast Steel Corp., Seattle; Patti-MacDonald Co. and Associates, general contractor.

1000 tons or more, federal office building, General Services Administration, Washington, to Bethlehem Steel Co., Bethlehem, Pa.; McCloskey & Co., Philadelphia, general contractor; steel piles also to be supplied by Bethlehem Steel Co.

950 tons, courthouse and federal building, Minneapolis, to United States Steel Supply Div., U. S. Steel Corp., Pittsburgh; Ring Construction Co., Minneapolis, general contractor.

510 tons, two undercrossings for freeway projects, Seattle, to Northwest Steel Rolling Mills Inc., Seattle; MacRae Bros., Seattle, general contractor.

485 tons, steel sheet piling, Walter F. George lock and dam, Ft. Gaines, Ga., to Bethlehem Steel Co., Bethlehem, Pa.

450 tons, state highway bridge, Greenfield-Bernardston, Mass., to Scherer Steel Co.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Pakistan, 31 turbocharged 1800 hp diesel locomotives, to Alco Products Inc., New York.

RAILROAD CARS PLACED

Norfolk & Western, 35 fifty-ft boxcars, to Pullman-Standard Car Mfg. Corp., Chicago. This road will also buy 10 fifty-ton bulkhead flatcars, and will convert at its own shops 50 gondolas for handling pulpwood, and equip 15 boxcars with deloaders.

Western Pacific, 60 freight cars, comprising 50 seventy-ton gondolas, placed with ACF Industries, New York, and 10 seventy-ton covered hoppers, placed with Pullman-Standard Car Mfg. Corp., Chicago. Twenty-five of the gondolas and the 10 hoppers are for the company's subsidiary, Sacramento Northern.

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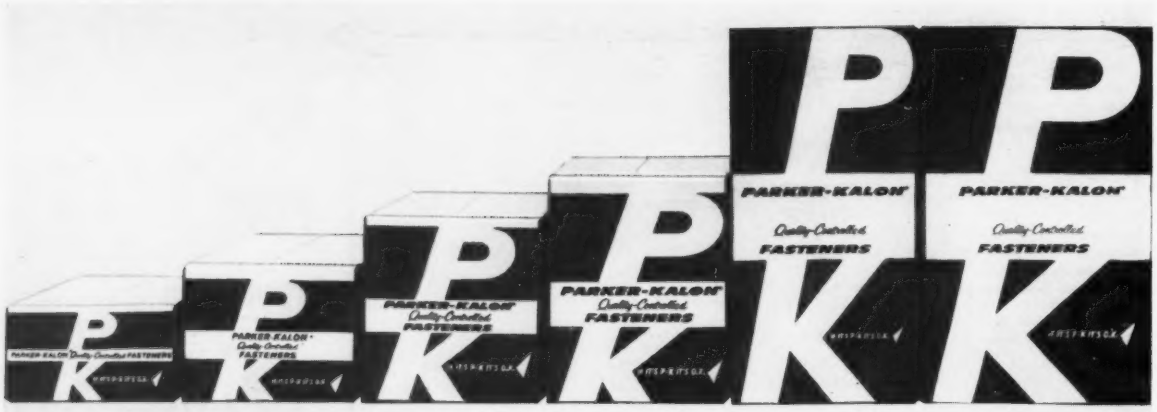
TO FIND THE MAN YOU NEED . . .

Place an advertisement in the "Help Wanted" columns of STEEL's classified pages. Your advertisement will reach the qualified men you need, because STEEL is addressed to highly-trained men in all phases of metalworking

STEEL
The Metalworking Weekly



A new concept in bulk-packaging of tapping screws...

the all-new P-K® BULK-KEG

Now . . . famous P-K tapping screws can be delivered to you in fixed keg quantities. Developed by Parker-Kalon, with the ultimate user always in mind, the new Bulk-Keg is designed to simplify ordering, handling, inventory control and production use. For the user's convenience, Parker-Kalon will package 80% of all popular stock size tapping screws in kegs containing 15,000 pieces. 15,000 **Other stock sizes will be packed in quantities from 2500 to 25,000 depending upon size of fastener. Ask your distributor to show you the P-K Bulk-Keg Package Schedule.**

Here's how the new P-K Bulk-Keg can help you

SAVE TIME . . . All information for speedy identification of keg contents is printed in *large*, easily-read type on *two* sides of the keg. *Tally Card* packed inside each keg aids maintenance of physical inventory at all times. Control is easy, accurate—from order desk to storeroom to production line.

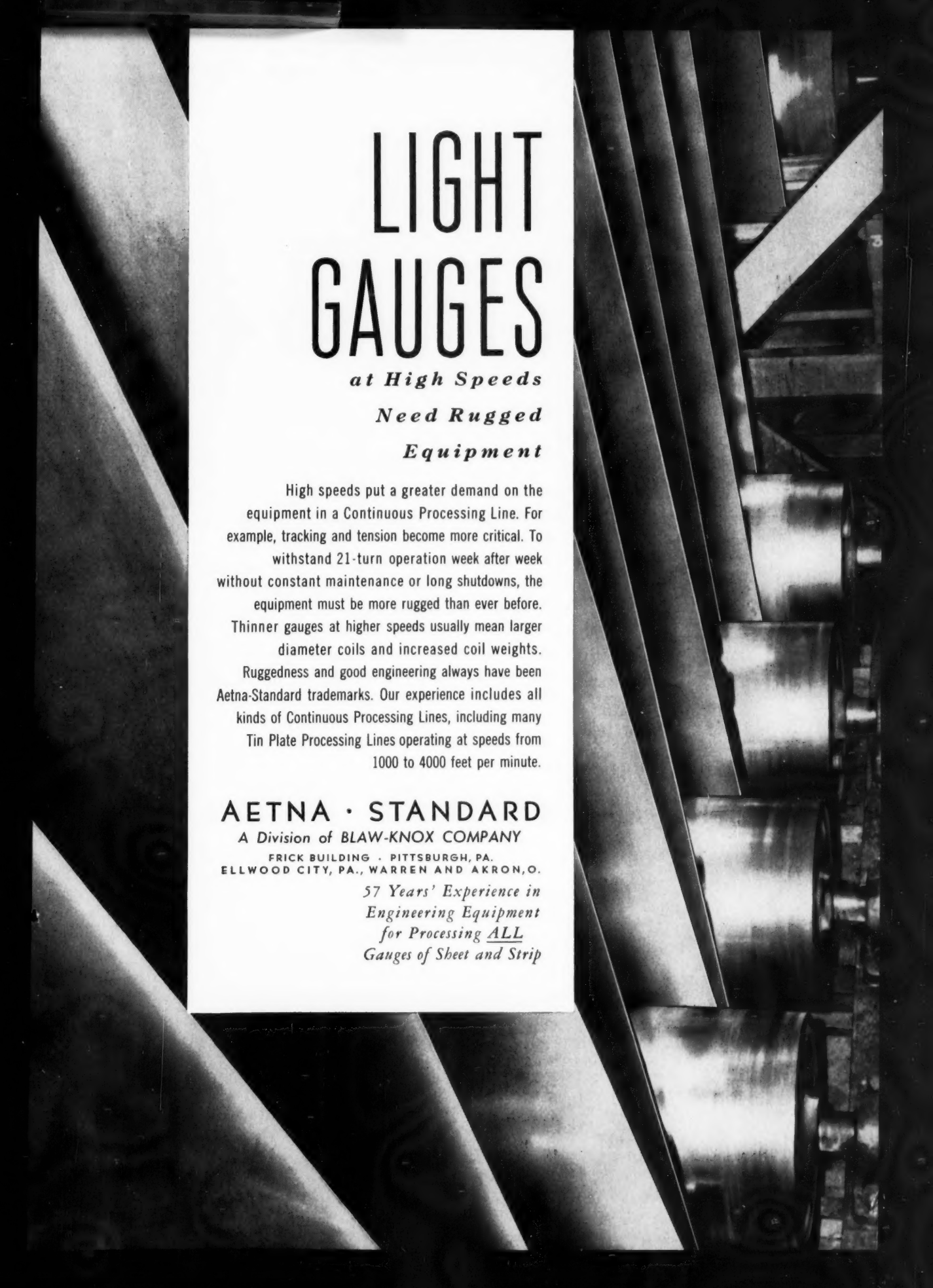
SAVE LABOR . . . *In the stockroom* there's no fumbling, no waste motion. Every P-K Bulk-Keg is uniformly 9″ wide by 9″ deep (with a single exception). All stack neatly, quickly and easily. *At the assembly line*, P-K's new Tear Tape feature makes opening and re-sealing of kegs simple and efficient. A pull on the tape and the pre-slotted cover opens to make a hinged top. No need for pliers, wire cutters, or aggravation.

SAVE MONEY . . . Neatly sealed P-K Bulk-Kegs make allocation of production quantities fast and orderly. No in-shop distribution of screws in open trays. No hazardous spilled fasteners on factory floors. Loss caused by dropped and broken packages in stockroom or at the assembly line is eliminated. The new keg has been independently pre-tested by Container Laboratories, Inc. of New York. It meets all drop, compression and impact tests.

For immediate delivery of P-K tapping screws in the handy, all-new P-K Bulk-Keg, call your P-K distributor—today!

PARKER-KALON® fasteners

PARKER-KALON DIVISION, General American Transportation Corporation, Clifton, N. J.
Offices and warehouses in Chicago and Los Angeles.



LIGHT GAUGES

at High Speeds

Need Rugged

Equipment

High speeds put a greater demand on the equipment in a Continuous Processing Line. For example, tracking and tension become more critical. To withstand 21-turn operation week after week without constant maintenance or long shutdowns, the equipment must be more rugged than ever before. Thinner gauges at higher speeds usually mean larger diameter coils and increased coil weights. Ruggedness and good engineering always have been Aetna-Standard trademarks. Our experience includes all kinds of Continuous Processing Lines, including many Tin Plate Processing Lines operating at speeds from 1000 to 4000 feet per minute.

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FRICK BUILDING · PITTSBURGH, PA.
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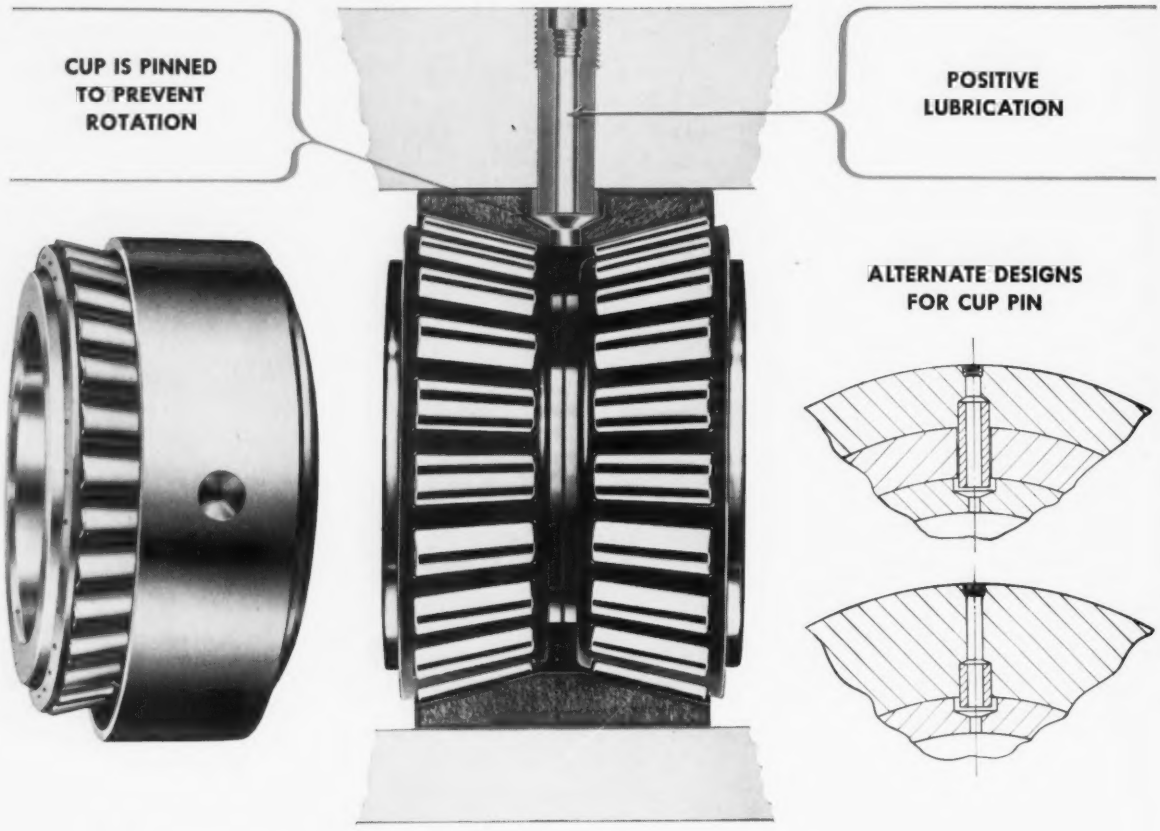
57 Years' Experience in Engineering Equipment for Processing ALL Gauges of Sheet and Strip



NOW! A double-row bearing for any floating position

REDUCES WEAR AND POUNDING
PROVIDES FOR POSITIVE LUBRICATION

Now you can get a new Timken® bearing—first of its kind developed for floating bearing positions—that answers the problem of excessive wear from creeping and pounding in gear drives, spindles and many other applications. It's a pin-cup, double-row tapered roller bearing. Manufacturers can assemble and adjust gear drives, then merely set the pin. Result is a bearing that floats endwise but cannot turn in the housing. It greatly reduces wear, provides for continuous, positive lubrication. This new Timken bearing gives you all these advantages for those applications where there is an inherent tendency for the cup to creep or turn in the housing.

1) *Positive lubrication* because oil is fed continuously through the pin.

2) *Longer bearing life* because bearing creep is eliminated. Related parts are better protected, too.

This new pin-cup bearing results from Timken bearing research and development. Research to make machines perform better at lower cost. And the combined, new $2½ million engineering and research facilities of the Timken Company, unique in the industry, make progress like this possible. Make it yours when you use Timken bearings in the machines you build or buy. Another reason why "Timken" is your No. 1 bearing value. The Timken Roller Bearing Company, Canton 6, Ohio. Cable: "TIMROSCO". Makers of Tapered Roller Bearings, Fine Alloy Steels and Removable Rock Bits.

WHEN YOU BUY TIMKEN® BEARINGS YOU GET...

1. Quality you can take for granted
2. Service you can't get anywhere else
3. The best-known name in bearings
4. The pace setter in lower bearing costs

BETTER-NESS rolls on

TIMKEN®

tapered roller bearings

This symbol on a product means its bearings are the best